EFFECT OF DIGITAL ECONOMY ON YOUTH UNEMPLOYMENT FOR SUSTAINABLE DEVELOPMENT IN AFRICA

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ABSTRACT

The African continent and Nigeria in particular have been blessed with abundant youths. A huge amount of investment was made to digitalize the economic sectors in the continent to achieve Sustainable Development Goals. However, the continent has been labeled with many unemployed youths whose wrong acts have jeopardized the continent by escalating insurgencies, terrorism, fuel looting, poverty, and inequality. This study examines the effect of the digital economy on youth employment. The study selected 420 respondents as samples from six countries of the continent, and a purposive sampling technique and probit model were adopted. The results indicate that the digital economy influences youths' employment in the continent precisely educating youths. The study suggests that adequate internet and other related infrastructures should be provided in rural areas. Also, alternative means that can accommodate those who may likely lose their jobs due to digital technology usage in the continent should be created.
Keywords: *digitalization, employment, job, sustainability, youth,*

Introduction

Tradition plays a great role in defining youth as a person's ability to involve in labour markets, education, marital and legal status, and psychological and financial independence. It is a transitional age from childhood to adulthood (Giuliani et al., 2017). Defining the word youth has so many connotations depending on the continent, country, culture, age range, and stages of life (Assaad & Krafft, 2016). Although, United Nations referred youths as people between 15 and 24 years of age for statistical consistency (United Nations, 2009). It has also recognised the definitions given in various nations and contexts. The majority of African nations defined youth as those who are in the age bracket of 16-35 years. The world large percentages of youth population are living in Sub-Saharan African nations, South Asia, Middle East, East Asia, Latin America, and North Africa (World Bank & IFAD, 2017). Using youths' sharp observation, knowledge, and constant is essential to achieving sustainable development (Ekka, Joseph, Verma, & Anandaram, 2022). Even though, youths are regarded as agents of change since they have value, a feeling of purpose, and success.

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In contrast, the inadequate of available jobs in the continent has made this large youthful pillar becomes a snuff to the potential development of the region. It has been reported by the African Development Bank that in 2015, one-third of Africa's youth who are between 15 and 35 years old were unemployed and about 10 million to 12 million youth enter the workforce in Africa annually and only three million formal jobs are created yearly (Donkor, 2021). This contributes to about 60 percent of all of Africa's jobless pond. According to the World Bank, the rate of youth unemployment rate in Africa varies. For instance, North Africa has a greater rate compared to Botswana, Senegal, the Republic of the Congo, Nigeria and South Africa, among others. The implications of youths unemployed have jeopardized the continent by escalating insurgencies, terrorism, fuel looting, poverty and inequality. These challenges are not only to Africa alone it's a global problem. With the existence of such challenge, the world would find it difficult to achieve and sustain global development. No wonder, the Brookings Institution considers the youth unemployment problem as a serious phenomenon deserves a greater consideration.

Digitalisation has been playing multifarious roles in numerous fields. It also improves the original transaction matching efficiency (Nnanna, Jelivov, Osman, & Isik, 2020). The digital revolution includes the application of communication and information technologies and large-scale proliferation. Also, Adeleye and Eboagu, (2019) admitted that ICT has an important influence on economic growth in Africa. According to them, digitalisation is a modern upsurge of technology, and it is instrumental to economic growth. Furthermore, digitalisation stimulates employment in two ways; as a working tool and an industry. This is because it provides job opportunities and at the same time eases jobs in workplaces (Raja, S., Imaizumi, S., Kelly, T., Narimatsu, J., & Paradi-Guilford, 2013). This led to today the increasing investment in digitalisation from many countries due to its positive impact on productivity and economic growth (Datta, A., & Agarwal, 2004). Digital economy is a part of the economy that drives its main or entire source from the digital technology and has a business's strategy placed around digital goods and services (Bukht & Heeks, 2017). The digital economy provides an indispensable function in environmental protection, fosters high-quality in economic development, and achieves sustainable development (Su, Su, & Wang, 2021). The digital economy relies on the digital infrastructure to achieve industrial digitalization, digital industrialisation and digital governance through technological change, which improves transaction efficiency, promotes the evolution of the division of labor, and improves the efficiency of resource allocation (Han & Liu, 2022). According to Jiao and Sun (2021) the micro-level digital economy is contrary to the traditional economy, which only emphasizes price and quantity in explaining various consumer needs through scope of production and economies of scale. Here, the application of digital technology not only eases both producers and consumers to realize economies of

scale, it also reduces supply and demand costs. The Meso-level digital economy promotes the intelligent transformation and digital network of traditional industries to form new models which lead to new business formats and new industries through industrial integration. Moreover, at the macro level, the digital economy generally affects economic development through effective and efficient production input and output (Jiao & Sun, 2021).

Moreover, the digital economy has moved the development of digital technology innovation and integration and the development of industrialization to the development stage of thoughtful integration of the digital economy and the real economy. Digital technology, as a general-purpose technology with the characteristics of high permeability and flexibility has natural integration with the real economy (Baus & Fernald, 2007). There is a need to energetically improve the digital economy to promote the division of labor, effective market role, promote sustainable economic development and guide the economic transformation toward the "green development" direction (Han & Liu, 2022). The growth of the digital economy has become a new effective approach to responding to the prevalent real economic sectors. Competition among firms has accelerated due to globalization. This requires sustainable development to endure in such a competitive environment (Zhang, 2023). Recently, there is expanding of infrastructure in Africa for boosting the economy of the continent. According to Adesina, (2023) the most growing African digital economies are Nigeria, Egypt, South Africa and Kenya. With the current trend, any intensified effort on expanding Africa's digital infrastructure by 10 percent may lead to a 2.5 percent yearly growth in gross domestic product (GDP). Also, expanding Africa's internet access from the existing 33 percent to 75 percent will lead to creating 44 million jobs, with three million jobs in online services by 2025.

Today's world is characterised by increased connectivity. The United Nations International Telecommunication Union (ITU) reveals that approximately 63 percent of the global population were active Internet users in 2021. The diffusion of digital technology into nearly every business and workplace is reshaping the world of work. One of the most widespread phenomena is that digitalization has been transforming how labour market's function. Overall, digitalization has penetrated almost all major economic sectors and changed the structure of the labour market. While it also brings important challenges. Opportunities Digital workers are distributed around the world with an asymmetrical organization of labour (ILO, 2022). Moreover, Mentsiev, Engel, Tsamaev, Abubakarov, and Yushaeva (2020) revealed that In today's world, there is an increasing of digital activities with every passing day, leaving a substantial impact

on the economy precisely on the per capital, employment, labor productivity and the Gross Domestic Product (GDP) among others. Therefore, it is essential to measure the impact of digital technologies and industries on the economy for the government to track investments and draft policies and regulations. This leads to a need to examine the effect of digital activities on the economy.

To sum digital economy and youth employment for achieving sustainable goals, we need to understand the term Sustainable Development (SD). It was initially introduced in 1987 to enunciate development that satisfies current needs without compromising future generations' ability to meet their own needs (Li, Li, & Guo, 2020; Zhao et al., 2021). Studies on Sustainable Development focused on three pillars namely economic, environmental and social dimensions. Sustainable development and digitalisation signify two greatly topical themes, each of them being debated in the literature (Yusof, 2022). Sustainable economic development is economic development that attempts to accomplish human needs in a way that protects the environment and natural resources for future generations. Therefore, it refers to economic function within the ecosystem, which can never be separated from the economy. In other words, sustainable economic growth includes managing both natural resources and physical resources such as land, labour, capital, land and all part of the environment. This means that, current utilising these resources shouldn't be exhausted, and are available to future generations (Zhang, 2023).

The digital and real economies are intensely integrated. Although the digital economy has become a significant driving force for the transforming economic impetus and development, the development of the digital economy depends on the level of economic development, industrial structure, urbanisation and government support (Yang, Shaorui, Oleksii, & P., 2023). Failure of Africa to utilise digital development for the incremental recent pace of economic and social development in the world will deny the youth population of the continent chance to live up to their potential (DE4A, 2017). This led youths to receive strong recognition in the 2030 Sustainable Development Summit Agenda adopted by world leaders at the UN in September 2015. The agenda consider youth as "critical agents of change". It pledges leaders to provide youth with a nurturing for the full potential of their capabilities and rights. It indicates youth employment is a particular challenge for sustainable development (AAI & OECD, 2015).

Lack of youth interest in farming as a profession is a world phenomenon as it is associated with several reasons and factors. These include economic, societal and cultural norms (Gailhard, Brennen, & Brennen, 2022). No

wonder, the inclusion of youths in the SDG document was stated in different goals such as Goal 4 calls for better education, Goal 8 calls for decent work and Goal 13 calls for youth in the poorest nations to be supported in addressing the impact of climate change. However, to achieve the target objectives of SDG, there is an expansion of the digital economy in most African countries which attracted a huge amount of investment and is expected to provide numerous jobs, yet, the effort has not clearly shown any impact considering the increasing number of jobless youths in the continent. This has necessitated the need to evaluate the impact on youth employment in the region. Therefore, this study attempts to examine the effect of the digital economy on youth employment in Africa.

Literature Review

Usually, most of the studies in this area focus more on examining the connection between sustainability and digitalisation. The studies conducted in four (Czech Republic, Hungary, Poland, and Slovakia) countries by Esses et al., (2021) on the association between digitalisation and sustainability using Digital Economy and Society Index (DESI) and Sustainable Development Goal Index (SDGI). The finding indicates there is a strong connection between sustainability and digitalisation. Herman (2022) examines the influence of digital entrepreneurship on the attainment of SDGs goals. The results indicate that there is a positive influence and a dissimilarity result in this matter among EU countries. Furthermore, Ionescu-Feleag ˘ et al., (2023) analysed the relationship between digitalization and sustainable development in the European Union (EU) countries, between 2019 and 2021, before and during the COVID-19 pandemic. The study uses Sustainable Development Goal Index (SDG Index) and Digital Economy and Society Index (DESI), and Spillover Index (SS Index). Results indicate a positive and significant connection between the digital economy and sustainability.

Besides, Balayev (2022) examined the opportunities and hindrances to the use of digital agricultural technologies for sustainable development in Azerbaijan. The study used 40 people representing 17 organizations, and PEST and SWOT, and multidimensional analysis methods were used. The results show that digital agro technologies have a positive impact on the agrarian entrepreneurship of youth. Chen and Qu (2023) examine the digital economic index and carbon emission concentration and used 282 Chinese urban panel data to analyze their features in spatial and temporal dimensions. The results indicate that the digital economy can reduce carbon emissions significantly. Jiao (2021) selected and assessed some industries of China's digital economy development index for 173 cities from 2011–2018. The study employed various models, such as the double difference method, the instrumental variable method, the spatial econometric

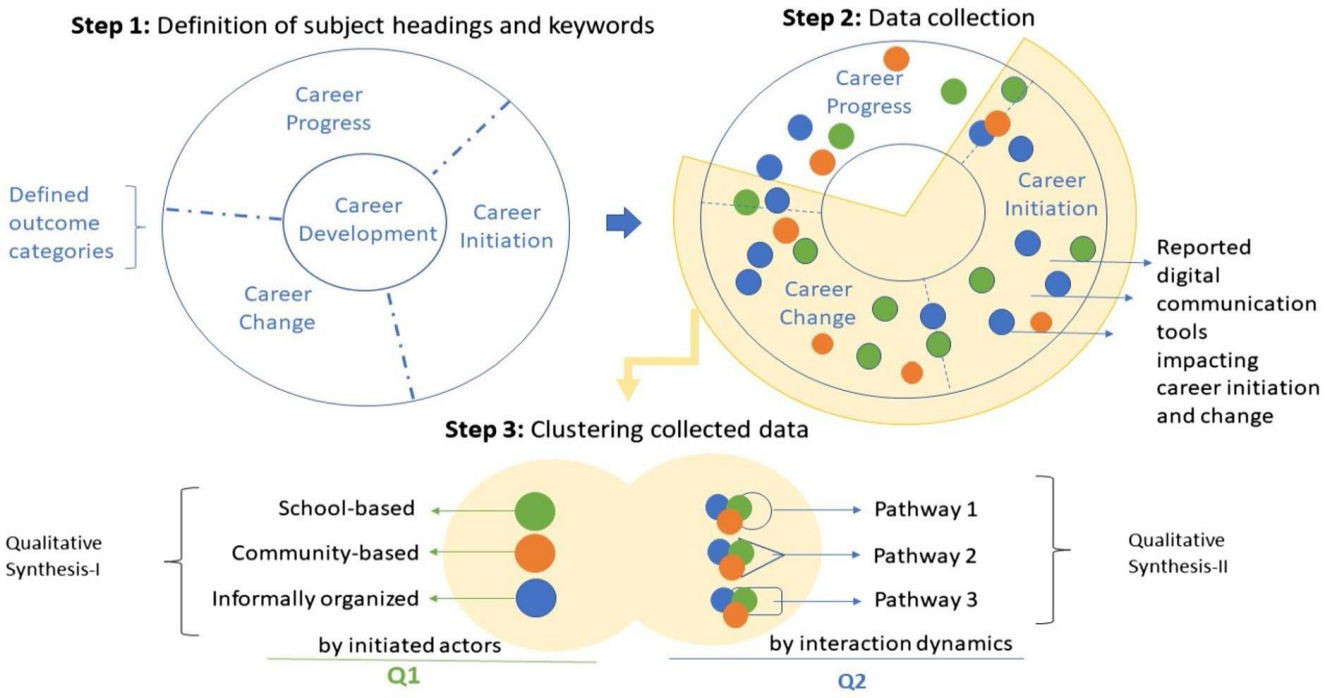
model, and the intermediary effect model. The findings show that China's digital economic development has a positive effect on urban economic growth. Yusof (2022) employed systematic review literature of 243 articles related to SDG from 2015- 2022. Out of this figure, only 33 were selected about youth participation in Indonesia and Malaysia. The results indicate practical approaches and incorporating formal education have supported the Educational Sustainable Development (ESD) of these two countries. Azu (2020) measured digitalisation from two viewpoints; mobile telephone and internet penetration rate subscriptions. The study employed a panel of 15 ECOWAS countries from 1994 to 2018. ARDL estimation technique was also adopted. The result indicates that digitalisation can decrease the youth unemployment rate in West Africa both in the short and long term if the infrastructure can be adequately available. Chen & Zhang (2023) used data from China's 284 cities from 2011 to 2020 to evaluate the effect, spatial spillover, and mechanism of the digital economy on prosperity. The results found that the digital economy has an apparent role in promoting common prosperity. In contrast, Imran, (2022] studied the relationship between sustainability and digitalization in EU countries using panel regression modeling. The result indicates that each constituent of the DESI indicator has a different effect on the SDG Index indicator.

The existence of a large number of youths unemployed and the increased usage of digitalisation in most economic sectors in Africa has created a gap that needs to examine on how the digital economy provides job opportunities to the teeming youths in Africa. Also, recent studies have focused more on practical and theoretical issues of the digital economy. While empirical studies evaluating the impact of the digital economy on youth employment are still in their infancy stage or have no existence. Thus, there is a need to explore the effect of the digital economy on youth employment.

Methodology

The existence of a large number of unemployed youths in the African continent coupled with increased usage of internet subscriptions with diverse government commitments and infrastructural development led to select six countries (Algeria, Egypt, Ethiopia, Ghana, Nigeria, South Africa, and Kenya) from the continent based on usage and availability of internet in these countries over others. This study followed some parts of methodologies conducted by Brenya, (2022); Gailhard, Brennen, & Brennen, (2022); Kwakye, Brenya, Cudjoe, Sampene, and Agyeman, (2021). With cautious thought of digitalisation tool, the researcher designed a questionnaire containing demography questions and the remaining items were grouped into 5. The three methodological steps employed in this study were illustrated in figure 1. The study employed a purposive

sampling technique and a well-vetted questionnaires were administered on-line to the 600 youth who are between the ages of 16 and 35. This is connected to disparity of youth age among the countries as some like Ghana youth age starts from 17- 35 years old, Nigeria 18 years old. A total of 420 youth who were randomly selected as a sample of the study. The questionnaire consists of information on the ease, effectiveness, and efficiency of the internet's role in real key economic sectors (agriculture, commerce, construction, art and design, finance, and transport). The study defined youth as someone who is between the age ranges of 16-35 years old. Also, Probit model was employed. It is a powerful tool model that is homoscedastic and the probabilities of dependent variables are dichotomous (Aldrich, Nelson, & Adler, 1984). The Probit analysis offers statistically significant results. Indeed, the association between a precise variable and the results of the probability is construed using marginal effect, which accounts for the partial change in the probability. The Probit model was used in many studies to determine the connection between the dependent and independent variables (Berihun, Bihon, & Kibrom, 2017; Ismail & Sivadas, 2020; Tanoh, Boadu, & Obeng, 2019).



Adopted from the work of Gailhard, Brennen, & Brennen, (2022).

Figure 1: The methodological steps of this review study

Results/ Finding and Discussion

Descriptive Result

The descriptive result was indicated in Table 1. The Table shows that majority of the respondents are male youth who represents 72%. Majority of the youth have access to internet (86%). Also, the 23-28 years old age category are the majority compare to other age categories. The youth level of education differs as about 38% and 30% attended secondary school and higher institution respectively with only 6% attended Madrasa. In considering the parental economic status's influence on pursuing youth career profession. It has revealed that 88% are from poor parental background. Government at all levels designed and implemented different policies towards encouraging youths to secure jobs. The responded believed that such government digital policies may not be adequately inspire them into any job (44%). While about 56% believed that governmental policies in digitalisation may aids in providing job opportunities to them. Also,

about 72% indicates that inability to secure lucrative job (white color job) has leads their interests in digitalisation. 62% indicates their attitudes towards digitalisation due to shifting and demand in the labour market has resulted their interest despite only 47% have knowledge on how digitalisation works. Moreover, it has indicated from the Table that 39 % respondents are willing and preferred to venture into agricultural sector, also, 38% for construction 53% for commerce and trade, 57% arts and design, 41% for finance (POS & ATM) and 44% for transport sector. This proved the influence the role plays by digitalisation in easing and providing effective and efficient services as well as minimization of cost and less fatigue in operation in economic sectors.

Regression result

The study observed the factors that may or not incline the youths' participation in digitalisation of economy. The analysis result indicates only variables that were significantly effect such as level of education (years spent in schooling) , government policy, access to internet, white color jobs, enlighten about how digitalisation work, as access to internet, government policy, attitude towards digitalisation, age in years (age), the number of years spent in school (education), and real economic sectors that include agriculture, commerce and trade, culture, arts and design, finance, and transport. The first column under the observation of the sample indicates the coefficient value, the *astray values refer to the P-value and the figures inside the bracket indicate the standard error coefficient. The next column indicates the marginal effect. This column indicates the change that may occur in digitalisation by the youth due to the change in independent variables. While the insignificant values were not reported.

Table 1: Descrptive Result

	Percentage (%)
Gender	
Male	72
Female	28
Age	
17- 22	27
23 -28	41
29- 35	32
Level of education	
Informal (Madrasa)	08
Primary	18
Secondary	38
Higher Institution	30
None	06
Years spent in schooling	
1- 6	24
7- 12	55
13- 15	16
More than that	05
Parental economic status	
Higher income (earns more than $100,000 per annum)	12
Middle income (less than $100,000 per annum)	88
Government policy	
Yes	56
No	44
Access to internet	
Yes	86
No	14
White color jobs	
Yes	72
No	38
Attitude towards digitalisation	
Yes	62
No	38
Knowledge on how digital work	
Yes	47
No	53
Economic sectors	
Agriculture	39
Construction	38
Commerce and Trade	53
Arts and design	57
Finance (POS & ATM)	41
Transport	44

The Table 2 indicates that an additional age of youth may likely increase his willingness in digitalizing activities by 6%. This is connected to their background. Also, an additional level of education by 1% precisely years in schooling may likely affects their interest in digitalizing by 7%. Government policy affects youth digitalisation, as such, an

additional well and good digitalisation policy by 1% on youth may leads their chances to secure more jobs by 4%. Internet plays a crucial role in digitalisation for youth employment. An increase in accessing internet by 1% may likely leads to an increase in youth digitalisation by 3%. Failure to secure a lucrative job by 1% may likely leads a youth to fervent into digitalisation activities by 2%. Moreover, an additional access to digitalisation of youth activities by 1% may likely leads to secure job in agriculture, commerce and trade, culture and designs, and financial sectors by 6%, 6%, 7% and 5% respectively. Even though, the results differed among the study areas precisely. Nevertheless, the results found from the results that digitalising the agricultural sector may likely lead to many educated youths to accept agriculture as their primary occupation and can lead many uneducated youths to lose their jobs. Also, digitalising commerce and trade, financial transactions, and art and design sectors may lead more youths to accept to work in these sectors.

Table 2: Probit Estimates and Marginal Effects Result

		ME
Age	0.085*	0.081
	(0.120)	(0.006)
Level of education	0.000***	0.000
	(0.018)	(0.017)
Government policy	0.065*	0.061
	(0.398)	(0.196)
Access to internet	0.002***	0.001
	(0.319)	(0.263)
Lucrative Job (White Color jobs)	-0.021**	-0.018
	(0.030)	(0.018)
Agriculture	0.064**	0.062
	(0.132)	(0.001)
Commerce and Trade	0.019**	0.061
	(0.5920)	(0.373)
Culture Arts & Design	0.027*	0.071
	(0.612)	(0.394)
Finance (POS & ATM)	0.055**	0.051
	(0.268)	(0.198)
Log likelihood	139.568	
Probability chi^2	0.0000	

ME – Marginal Effects
Significance levels * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Conclusion

This study administered a questionnaire in examining the effect of the digital economy on youth employment for sustainable development in Africa by selecting six countries and assessing the impact of some economic sectors of the region. Even though, the results differed among the countries. It shows that the digital economy influences youths' employment in the region precisely educated youths. However, further study should be conducted on the effect of digitalisation on labour productivity. The study suggests that adequate internet and other related infrastructures should be provided in the areas as well as additional policies that may ease to digitalize economy can be formulated by government at all levels. Also, alternative means that can accommodate those who may likely lose their jobs due to digital technology usage in the continent should be created. Furthermore, there is a need to update the curriculum of tertiary institutions to insert IT and other technological communication skills into the courses taught.

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