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BRIDGING THE DIGITAL DIVIDE: STRATEGIES FOR INCREASING ACCESS TO TECHNOLOGY IN REMOTE COMMUNITIES IN KADUNA STATE

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Abstract
Information and Communication Technology, internet skills and access have become a vital resource in contemporary society and improved the quality of live. However, there exists a gap, otherwise referred to as digital divide between the users of the technologies. This can be attributed to a distinction of people who do and do not have access to information and communication technologies. The concept of the digital divide stems from a comparative perspective of social and information inequality of skills and usage, considering the fact that there are benefits associated with ICT access. Hence, this study aims to identify the causes of the digital divide, its effects on remote communities, bridging the divide and devising strategies to increase access to technology in affected communities in Kaduna State. A qualitative research approach which was based on the digital divide theory was employed for in-depth insight into the study. The study used a purposive sampling technique to recruit a total of 30 participants for a focused group discussion. According to the findings, the digital divide in Kaduna remote communities is caused by poverty and infrastructural inequalities between rural and urban dwellers. Findings also show that the threats posed by the digital divide call for an all-inclusive approach that should result in improved economic development. It is recommended that closing the digital divide is critical to making socio-economic growth more equitable and sustainable. It is critical to bridge the ever-widening digital divide that exists between Africa and the rest of the globe, as well as inside and between African states, communities and people.

Keywords: Digital divide, Digital technology, Telecommunication, Remote communities

Introduction

The digital divide is the gap that exists between individuals who have access to modern information and communication technology and those who lack access. Digital divide is evident between communities living in urban areas and those living in rural settlements; between socio-economic groups; between less economically developed communities and more economically developed communities; between the educated and uneducated population (Onyishi & Ezechi, 2019). Individuals who live in poverty and are unable to meet their basic needs of food, clothing and shelter; social and economic obligations, and lack gainful employment skills and assets have low self-esteem. They also have limited access to social and economic infrastructure, such as education, health care, portable water and sanitation, and as a result, have limited chance of advancing their welfare due to their ability to do so. Despite the fact that poor individuals

may be found in both urban and rural locations, the prevalence of poverty in rural areas is much greater than that found in urban areas (Angalapu & Ikporukpo, 2019).

Steele (2020) posits that in today's global information economy, equitable access to information is a fundamental value to be adhered to. Nigeria, more than any other nation, exemplifies the urgent need for information and communication technology. Thus, when it comes to Information and Communication Technology (ICT) which includes mobile phones, personal computers and internet connections, rural populations in Kaduna State have suffered from marginalisation. Poor service in the remote communities is caused by capacity constraints in the communication network, a lack of infrastructure to support technology hardware and software, a scarcity of financial resources and an unreliable electric supply. All of these factors combine to make ICT usage difficult in the remote communities in Kaduna State.

According to Abul, Nkpoyen and Eteng (2019), the digital divide in remote communities is exacerbated by discrepancies in access to the internet and the World Wide Web by Nigerians, as well as a lack of understanding of search engines, poor internet connection quality, inadequate English proficiency and a wide range of socio-economic levels. When we talk about the digital divide in Nigeria, we are referring to the discrepancy between those who have access to the internet and computers and those who do not. Computers and the internet are present in the houses of the wealthy but not in the homes of the poor owing to the high cost of computers and the prohibitively high cost of internet connection in remote communities.
Desmond and Endurance (2022) postulate that for the purpose of acquiring information, connecting with others and competing in a global economy, the digital divide in Nigeria is a key wedge between the haves and have-nots. It is critical to comprehend the distinction between the haves and the have-nots in access to certain resources, especially in remote communities. At this moment in time, the society is increasingly dependent on digital platforms, and as a result, the public is divided into two groups: those who have access to a lot of information and those who do not. In this instance, the internet connection is quite important. Mukama and Kafuko (2020) explain that participants in this digital environment must have a reliable internet connection in order to participate, and those who do not have will be left behind in this post-modern race. A very important variable should be considered in this situation. It is not always the case that those who do not have access to a dependable internet connection do not have the financial means to get one. Many people, regardless of their financial means, may not have adequate internet connectivity. In certain instances, it is dictated by the geographical area in question. Consequently, as a result of regional internet issues, those who have economic resources have now joined those who do not have economic resources in the group of the informational disadvantaged.

In contrast to urban communities, remote communities may experience a digital divide for a number of reasons. The first reason as stated by Ye and Yang (2020) is that remote communities have impenetrable internet and broadband infrastructures. The second reason is that people in remote communities have limited means which prevents them from purchasing mobile devices and finally, the majority of the villagers are uneducated, which makes it difficult for them to obtain ICT skills. Digital media, a term often interchangeably used as information communication technology as stated by Van Dijk (2019) are used for everyday living in the society. For business, education and office jobs, its use is inevitable. Therefore, the need to significantly reduce the gap is pertinent and can be achieved by bridging the digital divide.

Over the years, several initiatives have been conceived by the government of Nigeria and other agencies to develop the ICT infrastructure in order to bridge the digital divide, especially in remote communities. Prominent among these initiatives are the licensing of the Global System for Mobile Communication (GSM) operators and Second National Operator (SNO), Public Service Network (PSNet), Nigerian Universities Network (NUNet) among others. There have also been massive investments in ICT infrastructure by Nigerians and non-Nigerians alike, the activities of which cover the whole country. Besides, the government of Nigeria, the International Centre for Theoretical Physics (ICTP), Italy, NIIT, Oracle, APTECH, Microsoft, and many other agencies have trained thousands of professionals in ICT and related areas to provide necessary knowledge and skills to support ICT activities in the country.

Statement of the Problem

Kaduna state, located in Northern Nigeria, is known for its high rural population. Therefore, its challenges are peculiar to the people. Ravaged by poverty, there is the issue of cost, whereby digital devices, such as smartphones, tablets and computers are expensive and unaffordable to people living in remote communities. In addition, Olaniran and Adepoju (2021) reveal that the cost of purchasing broadband services and internet connectivity can be significantly high in remote communities due to limited infrastructure, leading to a lack of access to digital technologies. Furthermore, there are cultural and societal barriers, such as gender norms and low level of education which can limit individuals' access to and use of digital technologies as stated by Umaru & Jalo, (2019). The scholars also include lack of digital literacy as a challenge. Many individuals in remote communities lack the skills and knowledge necessary to effectively use digital technologies which can limit their ability to access information, education and job opportunities.

Other causes of digital divide identified by Nwokedi, V.C (2020) include the brain drain where Africa's intellectual resources are constantly migrating to Western countries in search of greener pastures; low education budgetary factors, literacy challenges where a significant portion of the population, particularly in rural communities are still illiterate, a situation that is incompatible with sustainable application of ICTs, institutional level of policies which have resulted in under-utilisation of even the little available ICT resources, national ICT policies and regulatory constraints that militate against creating a conductive environment for ICTs and political factors that result in equitable distribution of national resources and development, leading to social and political instability.

Research Objectives

The objectives of the study are to:

i. Assess the causes and problems of digital divide among remote communities in Kaduna state.
ii. Identify the effects of digital divide on remote communities in Kaduna state.
iii. Determine strategies for increasing access to technology in remote communities in Kaduna state.

Conceptual Clarification

a) Digital Divide

Digital divide is a term that refers to the gap between demographics and regions that have access to modern information and communication technology (ICT) and those that do not or have restricted access. This technology can include the telephone, television, personal computers and internet connectivity (Tay, Tai & Tan, 2022). Similarly, Nwokedi (2020) defines digital divide as the gap that exists between individuals who have access to modern information and communication technology and those who lack access. The digital divide describes the gap between people who have access to affordable, reliable internet service (and the skills and gadgets necessary to take advantage of that access) and those who lack it. This is an issue within many countries with rural populations much more likely to be cut off from digital technologies than city residents are. The divide also exists among countries and continents and it exists between men and women. In 2021, 62% of the global male population was using the internet, compared to 57% of the female population, a gap that has been narrowing over the past decade (Nwokedi, 2020).

According to Umukoro (2019), digital divide is the unequal access to digital technology, including smartphones, tablets, laptops and the internet. The digital divide creates a division and inequality around access to information and resources. In the Information Age in which information and communication technologies (ICTs) have eclipsed manufacturing technologies as the basis for world economies and social connectivity, people without access to the Internet and other ICTs are at a socio-economic disadvantage, for they are unable or less able to find and apply for jobs, shop and sell online, participate democratically or research and learn.

There are numerous types of the digital divide that influence the efforts in accessing the internet. Some of the gaps in digital divide include:

Gender Divide
According to a 2013 report, the internet gender gap is striking, especially in developing countries like Nigeria. Though, mobile connectivity is spreading drastically, it is not spreading equally. Women are still lagging. Men in low-income countries are 90% more likely to own a mobile phone than women. This translates to 184 million women who lack access to mobile connectivity. Even among women owning mobile phones, 1.2 billion women in low and mid-income countries have no access to the internet.

Social Divide
Internet access creates relationships and social circles among people with shared interests. Social media platforms like Twitter and Facebook create online peer groups based on similar interests. More than ever internet usage has influenced social stratification which is evident in societies among those that are connected to the internet and those that are not. Non-connected groups are side-lined since they don't share in the internet benefits of the connected groups.

Universal Access Divide
Individuals living with physical disabilities are often disadvantaged when it comes to accessing the internet. They may have the necessary skills but cannot exploit the available hardware and software. Some parts of the world will remain segregated from the internet and its vast potential due to lack of digital literacy skills, low education levels and inadequate broadband infrastructure.

Similarly, an ITU report (2012) states that there are many dimensions to the digital divide. The digital divide exists between nations and within nations (ITU, 2012). Similarly, it exists between rich and poor, young and old, urban and rural dwellers (ITU, 2012). Moreover, there is a financial divide, a knowledge divide and a divide of confidence (ITU, 2012). The divide is also reflected in the concentration of information resources in a small group of developed countries and the imbalance of information technology assets among nations.

Another classification of the digital divide has been made by Smolenski (2015). Smolenski (2015) defines the following three types of divides: Firstly, there is a divide between those of high and low socio-economic status, including minority groups and single parents. The second type of divide is due to differences in experience, while the third type of divide occurs due to lack of access. To exemplify, due to a lack of infrastructure people in isolated rural areas might find it difficult to access the Internet.

b) Remote Communities

Remote communities are rural areas or regions that are geographically remote and have limited access to infrastructure and services (United Nations, 2019). The concept of Remote communities encompasses several dimensions, including limited access to education, healthcare and employment opportunities, as well as social and cultural isolation (Morrison & Eversole, 2018). ITU (2020) in a report Measuring Digital Development: Facts and Figures notes that disadvantaged and marginalised groups are overrepresented in the offline population which is disproportionately female, rural, impoverished, older and/or have low level of education and literacy. However, in identifying remote communities in view of digital inclusion, access to ICTs and the Internet is significantly influenced by factors like geography, income, age, sex, ethnicity and disability. In respect to this study, another parameter included in defining a remote community includes vulnerable communities that have been faced with insurgency.

As stipulated by Hill (2020), remote communities are located far from the urban areas and people living in such communities have been exposed to civilisation. However, they face unique challenges related to socio-economic development, and addressing these challenges requires a holistic and context-specific approach. By addressing issues related to education, healthcare and employment opportunities; policymakers, practitioners and other stakeholders can promote the development and well-being of remote communities and reduce social and economic disparities.

Theoretical Framework

Digital Divide Theory

The term digital divide was first coined by Lloyd Morrisett, President of the Markle Foundation (Hoffman, 2011). According to Hoffman (2011), Morrisett vaguely conceived of a divide between the information-haves and have-nots. While Morrisett is credited with the term, the coupling of ICT and inequality is not new. This belief is also evident in Compaine's (2011) claim that before there was a 'digital divide' there were the 'information haves and the have-nots. The global digital divide, as well as the digital divide within countries is also referred to as the technological divide or the lack of digital inclusion.

Digital Divide Theory postulates that there is an economic and social gap between the population of a nation and their access to technologies pertaining to information and communication. The inequality increases in the macro economy that extends to regions within a nation between nations, geographic areas and demographic areas. Thus, according to Digital Divide Theory, the digital divide exists for a number of reasons. One of the chief reasons is the widening economic gap in incomes. A rise in income leads to a rise in the accessibility and usage of technology, such as the internet. Poverty and economic barriers cut peoples' access to technology and information.

As stipulated by Lyons, Kass-Hanna and Greenlee (2020), digital divide was propounded on the basis of inequality. The concept of inequality according to this theory refers to the inequality in skills, digital literacy and participation. He defines digital divide as a partition amongst people who have access to and use of information and communication technology and those who do not. Based on the entire discussion regarding the concept of digital divide, the digital divide theory can be compared and linked to the government implemented policies and strategies that have increased the results and effects of digital use. This is consistent with the government's efforts to promote digital development as outlined in its policy on digital innovation.

Literature Review

Poverty and the Digital Divide

Digital divide is described as "a discrepancy in access to, distribution of, and use of information and communication technologies between two or more populations", according to the United Nations Development Programme (Jensen, 2017). Additionally, it was characterised as "the divide between those who have and those who do not have access to computers and the Internet. Mutula (2018) avers that several factors including poverty, illiteracy and other factors have been identified as preventing individuals from having access to computers and the Internet, resulting in only the rich being able to buy technology, particularly the most powerful equipment and software. The impoverished who often play the role of ethnic minorities are the ones who stand to gain the least from increased access to information and communication technologies. Attempts to close the digital divide are now at the heart of many poverty-reduction initiatives. Since political leaders in many developing nations have been unable to alleviate poverty in their countries, they cling to new technology and global commerce as their last best chance for raising the quality of life of their citizens in their countries.

In accordance with Margaret (2017), there are four different kinds of access obstacles: Having a lack of "mental access" refers to having a lack of rudimentary digital experience, while having a lack of "material access" refers to having a lack of computer hardware and network connections, and having a lack of "skill access" refers to having a lack of digital skills. It is the absence of "use access" that indicates a scarcity of relevant usage chances. Poverty, according to Urama and Oduh (2018) is defined as a lack of enough ownership or gainful control over assets (tangible and intangible), manual motor power or other types of production abilities. Urama and Oduh (2018) identify a variety of challenges that are prevalent among the disadvantaged population. These include illiteracy and a lack of access to proper information, among other things.

Angalapu and Ikporukpo (2019) cite a number of factors contributing to poverty, including a lack of information and telecommunications infrastructure and a lack of necessary skills. The majority of poverty-related arguments center on issues, such as poor nutrition, inadequate housing etc. It is only lately that some have begun to suggest that a lack of access to information and communication technologies (ICTs) is a contributing factor to poverty in developing countries. This position is not similar to conventional debates of poverty concerns, despite the fact that it is acknowledged that information and communication technologies (ICTs) have the potential to play a critical role in poverty reduction initiatives.

Reasons for Bridging the Digital Divide

Nwokedi (2020) has given the following as benefits derivable from bridging the digital divide:

i. Employment and Economic Growth: Bridging the digital divide by the deployment of ICTs offers the potential for commercial use by local entrepreneurs which may generate employment and economic growth. The entire gamut of the ICT sector can provide better paid skilled employment.
ii. Promote e-governance and e-commerce: The effective integration of ICT into the society is capable of promoting e-governance with its associated benefits of timeliness. The integration of ICT in the financial sector is a key factor for economic sustainability and improved social conditions
iii. Promoting academic excellence: Access to technology driven instructional resources offers access to a wide range of information and the effective use of the knowledge gained through such use increases improvement at all levels. Bridging the digital divide can significantly contribute to the attainment of the Sustainable Development Goals (SDGs) in Africa as observed by Morte-Nadal and Esteban-Navarro, (2022) in the following areas.
    - Education: The application of ICT based platforms, such as e-learning can go a long way in solving some of the problems of shortage of teachers and the physical infrastructure at all levels of the education spectrum in most African countries because ICTs can reach many people spread across vast geographical areas.
    - Health: Bridging the digital divide would enhance ICT-based health delivery systems. Public health campaigns and basic hygiene can be more effectively delivered and accessed by all citizens including those in rural areas.
    - Eradication of Extreme Poverty: The provision of telephony services (both fixed and mobile), as well as internet services occasioned by bridging the digital divide would create new opportunities for employment for many households. It has been discovered that the introduction of mobile phones has led to employment opportunities, as well as boost small and medium scale enterprises.

Bridging the Digital Divide: Nigeria's Situation

The various interventions to bridge the digital divide in Nigeria can be categorised into national, institutional and development agencies' initiatives.

Richard (2020) opines that tertiary institutions, especially universities across the country are developing projects to facilitate electronic networking and access to global information infrastructure by providing internet backbone that supports students and staff. Several development agencies are investing in infrastructure development in Nigeria. For example, UNDP is funding the improvement of internet connectivity in major countries in Africa, including Nigeria in a project called the internet initiative for Africa (IIA). Nigeria is also a beneficiary of the Digital partnership-an initiative of the World Bank which aims at linking systems and organisations in poor communities by way of disposing millions of computers from the developed world to developing countries.

On the other hand, the advent of GSM in Nigeria has helped to fuel internet connectivity, thereby attempting to bridge the digital divide. Many of the service providers, such as MTN, Glo, Airtel, Etisalat etc. have put up satellite to cater for national telecommunications services. Some like (MTN, Glo and Airtel) have even gone ahead to launch backbone networks, configured to include a mix of optical fibre transmission system linking various states with high capacity terrestrial radio and satellite systems. The MTN hub in selected

institutions is an e-learning centre to provide students and staff with access to affordable e-learning environment. The Glo network submarine fibre optic cable covering several countries is a right step towards bridging the digital divide (Oluwatusin & Adebayo, 2020).

At the national level, the federal government approved the National Information Technology Policy in 2001 by establishing the National Information Technology Development Agency (NITDA) with a view to making an IT capable country in Africa, thereby also bridging the digital divide. The objectives of the policy as enunciated in the Nigerian National Policy for Information Technology (2001) include:

- To ensure that information technology resources are readily available to promote efficient national development.
- Guaranteeing that the country benefits maximally and contributes meaningfully by providing the global solutions to the challenges of the information age.
- Empowering Nigerians to participate in software and IT development.
- Encouraging local production and manufacture of IT components in a competitive manner.
- Improving accessibility to public administration for all citizens, bringing transparency to government processes.
- Establishing and developing IT infrastructure and maximising its use nationwide.
- Improving judiciary procedures to enhance the dispensation of justice
- Improving food production and food security.
- Improving healthcare delivery systems nationwide.
- Promoting tourism and Nigerian arts and culture
- Enhancing planning mechanisms and forecasting for the development of local infrastructure
- Enhancing the effectiveness of environmental monitoring and control systems.
- Re-engineering and improving urban and rural development schemes.
- Empowering children, women and the disabled by providing special programmes for the acquisition of IT skills.
- Empowering the youth with IT skills to prepare them for global competition.
- Integrating IT into the mainstream of education and training.
- Creating IT awareness and ensuring universal access in order to promote IT diffusion in all sectors of our national life.
- Creating an enabling environment and facilitating private sector (national and multi- national) investment in the IT sector.
- Stimulating the private sector to become the driving force for IT creativity and enhanced productivity and competiveness.
- Encouraging government and private sector joint venture allocation.
- Enhancing national security and law enforcement.
- Endeavouring to bring the defence and law enforcement agencies in line with accepted best practices in the national interest.
- Promoting legislation (Bill and Acts) for the protection of online business transactions, privacy and security.
- Establishing new multi-faceted IT institutions as centres of excellence to ensure Nigeria's competitiveness in international markets.
- Developing human capital with emphasis on creating and supporting a knowledge-based society.
- To create Special incentive programs (SIPs) to induce investment in the IT sector.
- Generating additional foreign exchange earnings through expanded indigenous IT products and services.
- Strengthening National identity and unity.
- Building a mass pool of IT literate manpower using NYSC, NDE and other platforms as "train the trainer" scheme (TTT)for capacity building.
- Setting up advisory standard for education, working practice and industry.

The following institutional strategies have been put in place to achieve the above-stated objectives:

- Establishment of a coordinated programme for the development of a National Information Infrastructure (NII), State Information Infrastructure (SII) and Local Information Infrastructure (LII) backbone through VSAT, fibre optic networks, high speed gateways and broadband technologies.
- Providing adequate connectivity to the Global Information Infrastructure (GII)
- Addressing open standards for further liberalisation and fiscal measures, including incentives to substantially improve telephone teledensity and make IT more affordable to the citizenry.
- Establishing IT parks as incubating centres for the development of software applications at national, state and local government levels.

Challenges

The role of the government in creating an enabling environment for the ICT sector has faced considerable challenges, despite support by pan-African bodies like the UN Economic Commission for Africa (UNECA) with its National Information and Communication Infrastructure (NICI) process, and the New Economic Partnership for Africa's Development (NEPAD) with its e-Schools Initiative. The National Information Technology Development Agency (NITDA) which is charged with the implementation of the Nigerian ICT policy began to work with UNECA on the country's NICI process in March 2000. While a draft ICT policy has been produced by NITDA, it is yet to be finalised due to lack of consistent attention on the part of government. A Presidential Task Force on ICT Harmonisation was inaugurated in August, 2006. Its job is to examine the duplication of efforts and absence of cross-sectoral convergence in the government's ICT strategies. Various sub-committees have prepared reports but it appears that their efforts have been overtaken with the unexpected announcement in December, 2006 by the Federal Executive Council that several of the 27 government ministries have been merged, reducing the total number to 19 (Jensen, 2017).

Angalapu and Ikporukpo (2019) aver that the merger of the ministries has also impacted negatively on the work of a team of Nigerian experts that has been drafting a strategic plan for 2005 to 2008 with support from an UNECA consultant. It was hoped that the plan would streamline the various ICT initiatives in the country. As can be seen, these all-important assignments have been derailed by the same body (government) that initiated them due to the merger of ministries. According to Onyishi and Ezechi (2019), after the merger, new ministers were appointed, most of who did not share in the visions of their predecessors. This is one of the greatest challenges of policy-making and implementation in Nigeria, usually resulting in a "back-to-square-one" situation whenever new ministers (and other top government functionaries) are appointed, or a complete change of government is affected.

Nwokedi (2020) avers that another challenge facing the development of the full potential of ICT for education, research and development in Nigeria is the lack of a truly enabling environment and sound ICT roadmap and strategies by policy makers, resulting in unsustainable ICT development activities. Other challenges include:

- High running and subscription costs.
- Inadequate identification of information sources that meet the needs of users
- Poor Quality of Service (QoS) of the Internet and Telecommunication services.
- Regulatory issues.
- High cost of hardware.
- Ineffective management of network traffic and infrastructure.

Review of Empirical Studies

Desmond and Endurance (2022) studied bridging the digital divide in Nigeria. A qualitative research approach, based on the Diffusion of Innovation theory was employed to elicit primary data for in-depth insight into the study. The study used a purposive sampling technique to recruit a total of 30 participants

from the 6 geo-political zones across Nigeria for a focus group discussion that lasted for a period of three weeks. According to the findings, the digital gap in Nigeria is caused by poverty and infrastructural inequalities between rural and urban areas. Furthermore, findings show that the digital gap in Nigeria is an intentional institutional and political phenomenon. The threats posed by the digital divide call for an all-inclusive approach that should result in improved economic development. It is recommended that closing the digital divide in Nigeria is critical to making socio-economic growth in Nigeria more equitable and sustainable. It is critical for Nigeria to bridge the ever-widening digital gap that exists between Africa and the rest of the globe, as well as inside and between African states, communities and people.

Fang, Gill, Kunasekaran, Rosnon and Abd Aziz (2022) examined Digital Divide: An Inquiry on the Native Communities of Sabah. Van Dijk's theory of digital divide was explored on the four dimensions of digital divide (motivation, physical, skill and usage) among the native people in Sabah. A focus group discussion (FGD) was conducted among 21 key informants from seven different ethnic groups to identify the issues of ICT development in their community. The findings showed that the existence of a digital gap between the rural and the urban area community caused the community to be saddled with the connection to telecommunication service, including landline and internet. Despite the lack, the native community was receptive and willing to adopt ICT positively for their daily activities. While the theory of digital divide observes that the physical access divide is narrowing in most developed nations, this study shows that it is not the case for developing countries, such as Malaysia. The inequality in digital access is prevalent among the natives in Sabah, which could result in the opportunity to participate in important democratic decision-making.

Richard (2020) analysed the spatial distribution of Internet usage in Nigeria and identified its key determinants using data on the 36 states and the Federal Capital Territory from 2016 to 2018. In contrast to previous studies, the approach is disaggregated and spatial to better reflect state level disparities in Internet usage and its associated determinants. The data were obtained from the National Bureau of Statistics, United Nations Development Programme Report and other official sources, and were analysed using stepwise linear regression and Global Moran's I. The study showed evidence of disparities in Internet usage among the various regions in Nigeria with noticeable clusters of high values for Internet usage in Lagos, Oyo, Ogun, Kaduna, Kano states and Abuja. In contrast, Ekiti, Ebonyi and Bayelsa states had low concentration of Internet users. Across the nation, between the north and south and its urban and rural areas, Internet usage followed various clear economic and social contours. Market size, employment, income, access to electricity, urbanisation, gender (female), age (60 years and above) and telephone density were significant factors in Internet usage. The results of this study can provide basis for regional specific policies in order to increase Internet penetration in disadvantaged locations.

A study by Akinwale, Oladele, Adigun, & Olajide (2020) investigated the role of mobile phones in promoting digital inclusion in rural areas of Nigeria. The study found that mobile phones were a key tool for digital inclusion in rural areas, as they provided access to information and services, such as mobile banking, e-commerce and agricultural information. The study recommended that policies and programmes should be designed to promote the use of mobile phones and their applications in rural areas. Mobile phones encourage digital inclusion, allowing many Nigerians to gain from information interchange for social and business activities, increased productivity, and improved information access. Mobile customers can use these services to cut their costs for transactions, communication and transportation.

Maureen (2019) highlighted the key issues that influence the use of electronic information and communication tools among individuals and attempts to explore the Kenyan situation. The methodology of the study was through extensive literature review from journals and reliable reports. A total of eleven factors were found to contribute significantly to the current global digital divide. In Kenya, several strategies have been put forth in an effort to bridge the digital gap. This implies that the country is heading towards achieving the millennium development goals on universal access of information and communication tools.

Hamisu (2018) studied the Internet access and digital literacy (in terms of Internet technology application skills) in the rural areas of Garun-Malam local government in Kano State, Nigeria. The purpose of the study was to investigate accessibility level of the Internet (the technological infrastructures being used) and the level of Internet technology applications skills among the rural communities. The study employed quantitative data analysis method. 150 questionnaires were distributed, collected and analysed for the selected rural areas. The results showed that many respondents have access to the Internet, despite the fact that there are poor IT infrastructures used in all the rural communities. The study also revealed that majority of the respondents do not have basic skills of Internet technology application.

Research Methodology

The qualitative research approach was used in this study. Data was sourced from secondary and primary sources. Primary data was gathered through structured focus group discussions (30 participants). Participants were chosen from remote communities in Kaduna State. Consequently, students, journalists, academicians, entrepreneurs, government officials and administrators were among those who took part in the focus group discussions. The discussions took place over the course of two (2) weeks.

The researcher made use of networks and contacts in remote areas to identify potential participants and recruited them to participate in the study, as it allowed for in-depth exploration of the research questions, while ensuring the feasibility of data collection and analysis. The secondary data used in this study was generated from scholarly works gotten in academic journals and reports from international bodies and non-governmental organisations where publications were made on the subject matter.

Data Analysis

Table 1: Demographic of discussants

Characteristics		**Frequency**	**Percentage (%)**
Sex	Male	18	60
	Female	12	40
	Total	**30**	**100**
Age Range	21-30	7	23.3
	31-40	9	30
	41-50	12	40
	51 years and above	2	6.7
	Total	**30**	**100**
Occupation	Farmers	23	76.7
	Traders	7	23.3
	Total	**30**	**100**

Source: Field Work, 2023

The table shows the demographic spread of participants, their sex spread, their occupational spread and their percentage age ranges.

Objective One: The causes and problems of digital divide among remote communities in Kaduna State.

According to the discussants, education, lack of electrical infrastructure, income/poverty, urban drift, a lack of communication infrastructure, the cost of computers and smartphones, attitudes toward and responsiveness to digital technology, tradition/culture and other factors were cited as the causes and problems of the digital divide. 80% of the discussants identified poverty as the primary reason for digital divide in their community. 40% of discussants mentioned a lack of communication and electrical infrastructure. 20% of the discussants mentioned the cost of computers and mobile phones as a factor driving the digital divide in their community. 16 % of those who participated in the discussion said individuals'

traditional ideas and cultures were the reasons for the increase in the digital divide in their community. Consequently, an entrepreneur interviewed by the researcher made the following observation:

> *Some cultures and religious beliefs see advancement in technology and modernisation as a taboo and would fight to remain technologically backward.*

Another interviewee stated that:

> *Because telecommunication companies do not determine the location of masts in Nigeria, the location and distribution of masts and electrical terminals in Nigeria are not determined by profits. Instead, the location and distribution of Internet infrastructure are determined by government regulatory bodies and institutions which, on the surface, have the mandate to distribute these facilities and amenities evenly. In actuality, though, we can witness the stark gap that exists between communities and geopolitical zones.*

Objective Two: The effect of digital divide on remote communities in Kaduna State.
According to the discussants, these are some of the effects of the digital divide in Nigeria.

- Instability in the economy
- Illiteracy, especially among the youth in rural areas who are digitally illiterate.
- Youth restiveness arising from a higher rate of the unemployed and illiterate youth population.
- Increased poverty, especially in the rural areas and the rural-urban fringe.
- Increased political weakness among citizens arising from illiteracy, poverty and unemployment.

Objective Three: Strategies for increasing access to technology in remote communities in Kaduna.
The participants unanimously agreed that closing the digital divide in Kaduna State is a necessity, as most of the participants agreed that closing the divide has a significant multiplier effect on the economy and the social and political landscape, including addressing social and health issues. Thus, 90% of the discussants were utterly ignorant of any government initiatives aimed at closing the digital divide in their community. Instead, they believe that government initiatives have served to exacerbate inequalities in access to information and communications technology (ICT) facilities. However, 6% of discussants noted that, since the introduction of GSM and the revitalisation of the telecommunications industry, government has made concerted efforts and implemented policies and programmes aimed at reducing inequality in access to information and communication technology infrastructures from urban to remote areas. However, the usual Nigerian element has conspired to prevent the implementation of these measures from becoming a reality.

According to the discussants, these are some of the ways that the digital divide in Nigeria can be improved:
1. Improve the situation of educational facilities in rural areas and villages.
2. Situate more institutions and government parastatals in the hinterlands and communities to foster the settlement of civil and public servants in such communities.
3. NGOs should increase their presence and activities in rural areas, rather than paying lip service to digital divide issues.

4. Rural housing projects would also foster development in the rural areas.
5. Sensitisation against viewing urbanisation and technological development as a threat to cultures and traditions.
6. Increase electrical and telecommunication infrastructures in the rural areas to foster development.

Discussion of Findings

The goal of the study was to provide answers to three issues related to closing the digital divide and strategies for increasing access to technology in remote communities in Kaduna state. Specifically, with regards to

Objective 1, findings indicate that educational inequalities, electrical infrastructure inequality, Internet/GSM infrastructural inequalities, poverty, the cost of computers and smartphones in comparison to other developing countries, poor Internet infrastructure, deprived Internet services and connectivity issues are the most significant factors that contribute to the digital divide in remote communities in Kaduna state. According to Nwokedi (2020), there are four causes of the digital divide that can be classified into four types: lack of material access, lack of skills access, lack of mental access and lack of user access, among others.

In order to identify the effects of digital divide on remote communities in Kaduna state (Objective 2), findings from the study revealed that the major consequences of the digital divide are poverty, greater political weakness, increased illiteracy, increased youth restiveness which is caused by an increasing number of illiterate youths and economic instability. International aid agencies consider information and communication technologies to be important tools for national integration because they have the potential to increase access to health and educational services, while also creating economic opportunities for underprivileged populations groups, among other things. According to the World Bank (2016), information and communication technologies (ICTs) are critical to poverty reduction efforts. This corroborates Desmond and Endurance's (2022) assertion that information and communication technologies (ICTs) and telecommunication infrastructures have the potential to reduce poverty in developing countries. The most important question here is to determine the extent to which the issue of access to ICTs has influenced poverty and vice versa in the developing world.
Objective 3 was to determine strategies for increasing access to technology in remote communities in Kaduna state. Participants in the discussion noted the state of educational facilities in rural areas and the presence of government parastatals in rural areas to encourage the settlement of more literate individuals in rural areas. This move will drive development in rural areas, cause an increase in the presence and activities of non-governmental organisations (NGOs) in rural areas and communities, an increase in the number of rural housing projects and a shift from viewing urbanisation and technological advancement which constitute threats to existing cultures and traditions.

Conclusion
Information and communication technologies (ICTs) are critical instruments since they allow for increased access to health and education services, while also creating economic possibilities for under-served population groups. Closing the digital gap is crucial to making socio-economic progress equitable and sustainable across the globe. Due to the digital divide, it is becoming more difficult for remote communities in Kaduna state to maintain its progress in areas such as education, health and religion, all of which are fundamental human rights.

As a precaution against a dystopian future, we must give relief to alleviate current worries, while also planning for the long-term consequences of these concerns. Policies and initiatives must be implemented to close the digital divide. In conclusion, the issue of the digital divide is really a symptom of a far more serious problem with economic progress that needs to be addressed. As a result, this is an issue that affects both developed and developing countries across the globe. The digital divide will be removed if the economic issues of low education levels, inadequate infrastructural development and low quality of life or income levels are solved, especially in remote communities.

Recommendations
Following the findings and conclusion, the following recommendations should be taken into account:

1. The issues of poverty and low level of education, especially in remote areas must be addressed.
2. Inadequate telecommunication and electrical infrastructure in remote areas must be addressed by the government via bridging the digital divide.
3. Increased affordability of data and telecommunication devices by government and telecommunication service providers is crucial to bridging the digital divide.

4. The general population should be educated on the advantages and importance of using the Internet and the numerous resources available on it, in order to achieve economic and social progress.
5. Local content and apps should be generated in local languages that can be understood by the local community in order to boost Internet adoption in such areas.
6. Internet infrastructure development to include local, large-scale, cost-effective rural alternatives; such as the utilisation of satellite broadband technology, drones and earth-orbiting balloons.

References

Abegen, F. T., & Nambeh, T. (2019). Leadership, socio-economic and political development in Benue State: An appraisal of Rev. Fr. Moses Orshio Adasu's Administration. *North Central Journal of Political and Societal Studies, 2*(1), 1–11.

Abul, F., Nkpoyen, F., & Eteng, G. (2019). Socio-economic status of youth and involvement in criminal activities in Calabar Metropolis of Cross River State, Nigeria. *International Journal of Humanities Social Sciences and Education (IJHSSE), 3*(1), 79–83.

Angalapu, D., & Ikporukpo, I. (2019). Socialization and the question of development in Nigeria. *Verstehen Journal of Social Research, 1*(2), 11-22.

Ani O. E., Uchendu, C., & Atseye, E. U. (2017). Bridging the digital divide in Nigeria: A study of Internet use in Calabar Metropolis, Nigeria. *Library Management, 28*(6/7), 355–365.

Ayob, N. H., Aziz, M. A., & Ayob, N. A. (2022). Bridging the Digital Divide: Innovation Policy and Implementation in Malaysia. *International Journal of Academic Research in Business and Social Sciences*, *12*(8), 1373 – 1389.

Desmond, O. O. & Endurance, E. (2022). Bridging the Digital Divide in Nigeria, *Journal of Development Communication*, 33 (1), 45-54.

Fang, Y.X.; Gill, S.S.; Kunasekaran, P.; Rosnon, M.R.; Talib, A.T.; Abd Aziz, A. (2022). Digital Divide: An Inquiry on the Native Communities of Sabah. *Societies 12*, 148.

ITU (2012). "Chairman's Report on the Special Session on the Digital Divide". *World Telecommunication Development Conference*, Istanbul.

Iwara, I A., Adenike, O. & Abel, U. (2019). Bridging the Digital Divide: The Nigerian Journey So Far. *International Journal of Global Business*, 2 (1), 181-204.

Jensen, R. (2017). The digital provide: Information (technology), market performance, and welfare in South Indian fisheries sector. *The Quarterly Journal of Economics*, *122*(3), 879–924.

Lyons, A., Kass-Hanna, J., & Greenlee, A. (2020). Impacts of financial and digital inclusion on poverty in South Asia and Sub-Saharan Africa. *Social Science Research Network* http://dx.doi.org/10.2139/ssrn.3684265

Margaret, U. U. (2017). Bridging the digital divide: with special reference to Nigeria. *Journal of information and knowledge management*, 3 (1&2).

Morte-Nadal, T. & Esteban-Navarro, M.A. (2022) Digital competences for improving digital inclusion in e-government services: a mixed-methods systematic review protocol. *International Journal of Qualitative Methods* .21(1–9).

Mukama, E. & Kafuko, J. (2020). Factors influencing digital inclusion in rural communities in Uganda. *International Journal of Education and Research*, 8(8), 146-162.

Mutula, S. M. (2018). Digital divide and economic development: Case study of sub-Saharan Africa. *The Electronic Library, 26*(4), 468–489.

Nwokedi, V.C (2020). Bridging the Digital Divide in Information Technologies: Nigeria Experience. Inter. J. Acad. Lib. Info. Sci. 8(5): 178-183.

Oluwatusin, F. M., & Adebayo, O. F. (2020). Digital inclusion in rural Nigeria: Barriers, opportunities and the way forward. *International Journal of Information Management*, 54, 102151. https://doi.org/10.1016/j.ijinfomgt.2020.102151

Onyishi, A. U., & Ezechi, K. C. (2019). African leadership and political direction. In E. Nwabueze (Ed.), *New frontiers in contemporary African studies* (pp. 268–279).

Rice, R. E., & Pearce, K. E. (2015). Divide and diffuse: Comparing digital divide and diffusion of innovations perspectives on mobile phone adoption. *Mobile Media & Communication, 3*(3), 404–424.

Richard, A. (2020). Digital divide in Nigeria: The role of regional differentials. *African Journal of Science, Technology, Innovation and Development.* DOI: 10.1080/20421338.2020.1748335.

Smolenski, M. (2015). *"The Digital Divide and American Society"*. Retrieved 09/02/2006, from http://www.gartnerweb.com/public/static/techies/digital_d/national2.html.

Steele, C. (2020). *Top five digital divide solutions*. Digital Divide Council. http://www.digitaldividecouncil.com/top-five-digital-divide-solutions/

Tay, L., Tai, H., & Tan, G. (2022). Digital financial inclusion: a gateway to sustainable development. *Heiliyon*, 8(6), E09766. DOI: https://doi.org/10.1016/j.heliyon.2022.e09766

Umukoro, N. (2019). Democracy and inequality in Nigeria. *Journal of Developing Societies, 30*(1), 1–24.

Urama, N., & Oduh, M. (2018). Impact of developments in telecommunications on poverty in Nigeria. *Journal of Economics and Sustainable Development, 3*(6), 25–35.