

BRIDGING THE DIGITAL DIVIDE IN LOCAL GOVERNMENT: The
Study of Internet Access and Digital Literacy in Nigeria Rural Area.

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**BRIDGING THE DIGITAL DIVIDE IN LOCAL GOVERNMENT: The
Study of Internet Access and Digital Literacy in Nigeria Rural Area.**

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By

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Al-mighty Allah, my parent, and my Children

ABSTRACT

Internet access and digital literacy is still lagging in the rural communities of Garun-Malam local government and there are needs to investigate the reasons behind this unfortunate situation in order to overcome this digital handicap. Of course, good access to information technology (IT) is the fundamental element of any rural development activities. Therefore, this study focuses in depth the Internet access and digital literacy (in terms of Internet technology applications skills) in the rural areas of Garun-Malam local government in Kano State, Nigeria. The purpose of the study is to investigate accessibility level of the Internet (the technological infrastructures being used), and the level of Internet technology applications skills among the rural communities. Therefore, the study employs quantitative data analysis method, 150 questionnaires were distributed, collected and analyzed for the selected rural areas. From the results, it shows that many respondents have access to Internet, despite the fact that there are poor IT infrastructures used in all the rural communities. The study also reveals that majority of the respondents does not have basic skills of Internet technology applications. Furthermore, this study will usher a new era for its internal values and the results can be used by both State and local government. However, the outcome from this study may empower policy makers to makes decision/suggestions in bridging the digital divide that exist in the rural area of Garun-Malam local government. Bridging the digital divide is such a need that requires immediate attention for any concerned government.

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“It always seems to be impossible until it’s done”-Nelson Mandela

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CHAPTER ONE

1.0 Introduction

1.1 Overview

The origin of the term digital divide can be refer back to an unknown American source in the middle of the year 1990s and was first used in an official publication by the United State, Department of commerce's National Telecommunication and Information Administration (NTIA, 1999). However, the term digital divide commonly refer to the gap between those who do and those do not have access to new forms of IT. These forms refers to the computers and their networks, but still other digital equipment such as mobile telephony and digital television are not ruled out by some users of the term (Jan, 2006). On the basis of the above, technological infrastructure and the internet facilities are the fundamental tools that can be used to bridge the divide not only in the rural communities but also the underserve areas within urban communities. However, it is through the effective utilizations of those tools, the socio-economic, political, education and social development can be measuredwith greater satisfaction.

Furthermore, internet access refers to the ability to access the internet without having restrictions placed on your door where you go while you are online. On the other hand, Internet access is the services that provide access to the global system of interconnected computer networks known as the internet (US National Broadband plan, 2009). Lack of access to the Internet is a major element of the digital divide. Research consistently identifies ethnicity, income, age and education as significant predictors of access to technology, (France and Lemuria, 2006). Therefore, the issue here is that by given total access of internet to the

rural communities, the socio-economic, education and political factors of the communities will surely be eradicated. Moreover, one of the great challenges of broadband is to provide service to potential customers in areas of low population density, such as to farmers, traders, and small towns and most of these issues are in the rural area. In cities where the population density is high, it is easier for a service provider to recover equipment costs, but each rural customer may require expensive equipment to get connected. While 48% of Nigerians had an Internet connection in 2011, but only 10% from the above figure are connected in rural areas, (Garko, 2011). Wireless Internet Service provider (WISPs) is rapidly becoming a popular broadband option for rural areas, (US National Broadband plan, 2009).

However, the question here is that “does the rural communities digitally literate”? and “do they have basic skills of internet technology applications”? Digital literacy is the awareness, attitude and ability of individuals to appropriately use digital tools and facilities to identify, access, manage, integrate, evaluate, analyse and synthesize digital resources and construct new knowledge/media (Casey and Bruce, 2010). Research around the digital literacy is concerned with wider aspect associated with learning how to effectively find, used, summarize, evaluate, create and communicate information while using digital technologies, not just being literate at using a computer. Digital literacy encompasses computer hardware, software (particularly those used most frequently by businesses), the Internet, cell phones, PDAs, and other digital devices. Therefore, the digital divide is a complex and dynamic phenomenon, though despite the extensive studies on the digital divide and its impact by many researchers, developing countries in particular, are still searching for sustainable solutions to reduce the

digital gap, more specially between urban and rural areas, to leverage their investments in IT towards the attainment of greater economic and social benefits and increase global competitiveness (Anwarul and Keita, 2010). However, to bridge the digital divide, there is a needs for establishment of technology driven e-government, which includes e-administration, e-commerce, e-agriculture, e-health and so on (Kabir, 2009). Therefore, the restriction for the development IT is not only financial limitation, but also absence of absolute attention and poor style of administrations by the government. The ability to access the technological and scientific information as well as social information does not just give the nation power, but also enables the nation and its people to live in a better life in all aspect of human endeavour (Anwarul and Keita, 2010). If you cannot access the technology, then you cannot access the information and you will be left behind in almost all aspect of life (DiBello, 2005). IT can have significant effects on various aspect of the life of individual, ranging from access to accurate and timely information to employment opportunities or even social inclusion (Tambulasi, 2009).

With rapid development of IT and Telecommunication technology, human communications becomes the limitation of time and distance (Kwoting, 2010). Information literacy and the ability of information applications have really become an important and basic knowledge for modern society. Of course, knowing how to search, access and the potential opportunities created by telecommunication technology and the available resources can really help to improve people's quality of life and socioeconomic predicament. However, due to different social background, there have been uneven opportunities of access to IT,

this referred to phenomenon of unequal access among urban and rural areas information system as the "Digital divide".

1.2 **Background of the Study**

Around early year of 2000, the digital divide commonly defined as the gap between those who have and those do not have access to the computer and the internet has been a central issue on the scholars and political campaign agenda of new media development in Nigeria. Much attention concerning unequal access to and use of the new IT has been addressed. The federal government of Nigeria has designed a National Policy for Information Technology with the vision statement of to make Nigeria an IT capable country in Africa and a key player in the information society by the year 2005, using IT as the engine for the sustainable development and global competitiveness (Nig. IT policy, 2000). IT activities are fundamental element of any rural development activities. Nation will absolutely become digital, if such nation reduces the gap by taking different rural initiatives for providing IT facilities. The internet and its access are the most effective tools for bridging the gap, and the internet facilities are the sound pre-condition for bridging the digital divide.

The rural communities are isolated, no opportunity in every aspect of life, no e-knowledge, no funding, no technological infrastructures, no economic opportunity and no both national and global up-to-date information (Henrik, et.al 2007). IT greatly facilitates the quick and easy access to Information and knowledge which offers the socially-marginalized and unaware community unprecedented opportunities to attain their own entitlement (Akar, 2004). Majority of the people living in the rural areas do not even know what internet

and its application are all about, unlike urban area where majority of the youth can access internet either through mobile or Internet cafe. In line with the above, it has become apparent that research is needed to discover the effective framework to bridge the gap between rural and urban areas in to success. However, there are social and economic divides between poor, rich and illiteracy even in the urban areas. In looking at this differences, divides has not only a "digital" or technological divide, but also social and economic. Therefore, the divide between technologies "haves" and technology "have not" is significantly wide. A large number of people especially those in the rural areas do not even have close access to the new technological infrastructures to bridge the divide between them so as to increase better economy and life standard to meet the global challenges.

This technology is crucial for the developing countries to alleviate social, economic, education, health and gender equality problems. However information technology is still lagging behind in these countries due to the following reasons:-

Computer illiteracy and shortage of skilled Professionals

Most people are computer illiterate. There is a weak computer education infrastructure. Most of the computer training schools are situated in urban areas. Additionally, these few computer science and IT departments are admitting a few numbers of students due to lack of resources for instance shortage of computers and high cost of Internet (Sofia and Caroline, 2010).

Lack of national effective guideline and consistent ICT policy

There is a need for national guideline policy for today's information society and utilization. Absence of it will really affect all aspects of human activity and lifestyle not only in rural communities or state level, but the country in general.

By improving communication technology, we can increase communication and improve the life style of the society (Sofia and Caroline, 2010).

Poor quality of internet services and facilities

The internet access is affected by poor telecommunication services in most of the rural areas in Nigeria and unfortunately governments monopolize the telecommunication industry for their own interests which has led to backward technologies and unaffordable cost structures (Sofia and Caroline, 2010). However, according to Sofia and Caroline (2010), besides the facilities issue, there is a general lack of computer and internet equipment. Only a few people have computers with internet access, and is mostly available in some governmental offices, (in urban area, but even in local government offices, it will be much difficult to find out one single computer with internet connectivity), and other private companies. At the same time, the cost of computers, software and modems are more expensive than in most developed countries. The electric energy and the telecommunications infrastructure are very limited due to this reason; a lots rural areas and towns remain without electricity for days or even for months.

The internet is the most effective tool for bridging the gap and internet facilities are the pre-condition for bridging the digital divide. Information and communication activities are a fundamental element of any rural development activity. Rajjora (2002) cited in Anwarul and Keita (2010) that the use of the ICT facilities is much higher in urban areas compared to rural areas. However, in many countries, the developed communities from developed areas have gone into intricate networks and information superhighways; the indigenous communities of under-developed areas have not been heard of computers and internet.

1.3 **Problem Statement**

Hirschkop (1996) warns, unless all people have access to a range of network services, “instead of extending access to the one community (urban) the new technology will install a new form of communication apartheid”. There is no reason why in what so ever circumstances, thousands of people living in rural areas to denied access to information through new technological infrastructures. Every citizen needs to be treated equally, social amenities' and access to IT needs to be provided to improve the quality of life of every individual irrespective of geographical location without segregation. *Good Internet access is one of the problems facing People living in the rural areas of Garun-malam local government, Kano state of Nigeria.* Of course, good access to IT is the fundamental element of any rural development activities. It is observed that IT is currently playing a gradual important role in the local government's areas of Nigeria (Asim, 2000) especially for those who live in rural areas where most of their activities are related to farming. However, there is still a lot of work to be done as most of the development centres in urban areas while the rural communities are being neglected (Chester and Neelameghan, 2006). This shows that there are little efforts in the establishment of IT and very unfortunately those that are in existence are predominantly urban based, even though; most of the popular does not have access to internet facilities'. Rural areas will absolutely become digital, if the government makes serious move to reduce the gap by taking different initiatives for providing good Internet access and new technological infrastructures.

People in the rural communities of Garun-Malam local government are not trained to use the Internet technology in order to have the basic skills of Internet

applications (Garko, 2011). Software's are so out-dated that it cannot be applied to the benefit of the communities (schools or businesses). Those that obtained basic skills about Internet technology applications forced themselves to learn either from private computer schools (situated in urban areas), colleges or heard learning. On the other hand, communities are then forced to use the out-dated technology without any success (Olabode, Akinsola and Jacobs, 2005). IT greatly facilitates the quick and easy access to information and knowledge which offers the socially-marginalized and unaware community unprecedented opportunities to attain their own entitlements (Akbar, 2004).

According to Jian and Zhijin (2011), the experiences of developed countries show that even possess the information infrastructure; most poor still are excluded outside the information revolution because of lacking of cultural quality and basic computer skills. Scientific and culture qualities rural residents are relatively low and information quality is also low for insufficiency of special training. Their sensitivity of the information is not strong, so great difficulties is brought about in improving production and daily life because of the little information perception, information obtain and information usage.

Edwin (2008), a lots of seminars, conferences and media discussion were conducted to find the sound and sustainable solutions towards bridging the digital divide in the rural areas especially at federal level, but yet, today this issue of bridging the gap of digital divide become a political campaign agenda, not only in the local government or state levels but the nation in general. This shows that government are not serious in taking the basic steps to bridge the digital divide in the Nigerian rural communities and however this will lead to poor economic, social and economic development in the country.

The digital divide is more than about having computer and access to internet; it is a divide that affects and reinforces fundamental economic and social divide not only between rural and urban areas, but the country in general. Those who are "connected" of course, are in for greater advantage in terms of competing on a global basis and increase their social and economic value, while those who "are not" will be condemned to diminished knowledge, social and economic advantage(Barclay and Duggan, 2008).

Therefore, ability to have good Internet access and makes use the potential Internet technology applications can really help to improve people's quality of life and socioeconomic standard in the rural communities. It is good news for rural communities that nowadays different steps are taking shape and interest groups are coming up with their own interpretations and agendas and in order to build a digital society. It needs to build a system where information will be readily available online and people from different parts of the communities will avail themselves of the information through different channels(Olabode et al, 2005).

At this end, the research focuses on the problems associated with the Internet access and digital literacy in terms of Internet technology which greatly affects the life of the rural communities of Garun-Malam local government, Kano state, Nigeria.

1.4 **Research Questions**

Based on the preliminary study conducted on digital divide on the cause of this research, the rural communities of *Garun-Malamlocal* government are facing serious challenges towards the new technological infrastructures. Therefore, in

order to address this issue, this study will address the following Research Questions:

1. What is the internet accessibility level (infrastructures-wise) of the rural communities of *Garun-Malam* local government area of Kano State, Nigeria?
2. What is the digital literacy level in terms of Internet technology application skills (knowledge) of the rural communities of *Garun-Malam* local government area of Kano State, Nigeria?

1.5 **Research Objectives**

Specifically, the objectives of this research are as follows:

1. To determine the internet accessibility level of the respondents of the rural communities of *Garun-Malam* local government area of Kano State, Nigeria.
2. To examine the internet technology applications literacy level (Skill) of the rural communities of *Garun-Malam* local government area of Kano State, Nigeria.

1.6 **Scope of the Study**

The scope of this research includes the following:

The research is confined to *Garun-Malam local government* with emphasis on four rural areas (*Garun-Malam, Chiromawa, Yadakwari, and Garun-Babba*). The sample size of this research consist of one hundred and fifty respondents, i.e. All the one hundred and fifty (150) respondents are fully residence of the above

mentioned rural communities. Thomas (2003) who notes that the overwhelming majority of research study are conducted on convenience or available sample, data for this research was drawn from a population of 150 respondents from the selected sample areas of Garun-Malam local government. However, Internet access and digital literacy in terms of Internet technology (knowledge) in *Garun-Malam* local government area is precisely the main focus on this research.

1.6.1 **Geographical location of the case study.**

Garun-Malam is one of the 44 local governments in Kano State of Nigeria, created in October, 1996 by the Nigerian Military Head of State, Late General Sani Abacha (May his soul rest in peace) with total population of 118,622 as of March, 2006 census. The people of the community are 100% Muslim and educated both Islamic/western educations, (especially Islamic education). The major occupation of the people of this community includes; Farming, trading and cattle rearing. Below is a Map of Nigeria state with 36 states including the Federal Capital Territory, (FCT Abuja). The softcopy of the map of Kano state with *Garun-Malam* local government could not be obtained except the hardcopy which is attached in the appendices.



1.7 Significance of the Study

This research work will usher a new era for its internal value and the result (finding) can be used by the policy makers both local and state government to make a move towards sound and sustainable solution for the provision of good Internet access and basic IT skills in order to bridge the gap that exist between urban and rural areas (Kabir, 2009).

Furthermore, the research will reduce digital gap that exist and leverage stakeholders and government investments in IT towards the attainment of greater economic and social benefits and increases global competitiveness. The peoples

of the rural areas as well, will equally have better access to the global information and increase their skills in accessing new technological infrastructure.

Cecchini (2003) cited in Olabode et al.(2005) and identifies three priority areas in which IT potential could be attached for the reduction of poverty: Opportunity, empowerment, and security. Opportunity makes markets work improved for the poor and increases poor people's assets. Empowerment makes government institutions work effective and efficient for poor people and eradicates social obstacles. Security helps poor people cope with danger. The comparatively low cost and wide reach of IT infrastructures, such as the Internet, radio and television enable the conveyance of education to remote rural areas, and IT training is beginning to be accessible at rural schools and private institutes. IT can also improve health-care delivery to the poor. Telemedicine can diminish the cost and hardships of long-distance travel for medical attention and diagnosis. E-mail and medical list servers can deliver recent medical findings to health workers lacking research and technological facilities, at a minimal cost.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter discusses digital divide and its associated concepts. Digital divide effectiveness and the needs for bridging the divide will be elaborated. Internet access and Digital literacy will equally going to be highlighted. Moreover, Digital divide in Nigeria, and analysis of ICT provision in Nigerian situation also introduced.

2.1 Digital Divide Concepts

In the era of the knowledge society, access to the infrastructure to share knowledge is vital for social and economic development. Within the international development community, there is now strong agreement on this (Stella, 2005). It is widely accepted that information, communication and knowledge cannot remain the preserve of development experts in attacking poverty but must become the elementary tools of the poor in improving their own lives. There is equally strong consensus on the dangers of the hastening inequity of access to knowledge both within and between countries.

The digital divide is a complex and dynamic phenomenon, though despite the extensive studies on the digital divide and its impact by many researchers, developing countries in particular, are still searching for sustainable solutions to reduce the digital gap, more specially between urban and rural areas, to leverage their investments in IT towards the attainment of greater economic and social benefits and increase global competitiveness. However, to bridge the digital

divide, there is a need for establishment of technology driven e-government, which includes e-administration, e-commerce, e-agriculture, e-health and so on (Kabir, 2009). Therefore, the restriction for the development of IT is not only financial limitation, but also absence of absolute attention and poor style of administrations by the government. The ability to access the technological and scientific information as well as social information does not just give the nation power, but also enables the nation and its people to live in a better life in all aspect of human endeavour. If you cannot access the technology, then you cannot access the information and you'll be left behind in almost all aspect of life. IT can have significant effects on various aspect of the life of individual, ranging from access to accurate and timely information to employment opportunities or even social inclusion (Tambulasi, 2009)

People in the rural communities need access to mechanisms that provide multiple sources of rapid information and information exchange. The Internet and associated technologies are pivotal to the new means of knowledge acquisition. The question is: how should new ICTs and traditional knowledge systems be integrated at the community level in order to maximise the development potential of both?(Corlane andEvan,2008).

According to Andrew et al. (2000) access is consistently identified as a key principle in policy discussions; it is not an end in itself. Access simply enables further activities that can only partially be specified beforehand. There are three main questions to address: (1) Access for what purposes?(2) Access for whom?and(3) access to what? In an effort to responseto these questions, Andrew (2000) says that improving the ICI holds the promise of empowering all citizens to join more fully in all phases of economic, social, cultural and democratic life

(Clement, 1998, Karim, et.al., 1998, Schon, et. al, 1998, Dutton, 1999). A central notion is the possibility of participative interaction with others. In contrast with existing electronic media, digital networks allow people to be creators as well as recipients. In many situations, computer based information and communications technologies (ICTs) offer significant advantages over conventional media for accessing, creating, exchanging and sharing information in the conduct of daily affairs, thus benefitting the social individual in each of his or her major roles as consumer, producer, caregiver and citizen.

Access to new technological infrastructures for all is of course imperative, at least for all citizens who need and wish to make use of the ICT. However, to the point that network services are treasured, no citizen should be excluded from the opportunity of partaking in their advantages. Furthermore, the benefits for everyone expand as more people become reachable through the network. However, not all citizens are alike and we need to recognize the diversity of people and their particular access needs. This involves recognizing the obstacles to access the internet are characteristic of various 'populations', notably age, gender, income, education, disability, and geographic location (urban, rural and remote) areas. The Internet is currently the focus of most of the attention, it is important to see it and other data communications developments as additional components of the wider infrastructure with a long history of evolution, (Andrew, et al, 2000).

According to Corlane and Evan (2008), empirical evidence has suggested that various governments have been challenged, and continue to struggle, to find, strategies for reducing both the external (between countries) and the internal (within countries) digital divide as is evident by the increased digital

opportunities initiatives. Dewan & Riggins (2005), contend that much of the research on the digital divide focuses on “first order effects” regarding who has access to the technology, but only a limited number addresses the “second order effects” of inequality in the ability to use the technology among those who do have access. The diffusion of ICT is a mere starting point; using the technologies to transform organizational capabilities toward the attainment of tangible economic benefits will only emerge from appropriate deployment within the particular area *of need* and the maximization of their capabilities through effective use. Traditional wisdom suggests that access to and use of technology does not in themselves provide sustained benefits but rather the capability to transform adopted technology into tangible economic benefits provides the key for transformation.

Corlane and Evan (2008), policy makers and governments have also adopted initiatives and explored mechanisms for leveraging digital opportunities. The G8 Head of States created the Digital Opportunity Task Force (DOT Force) as a cooperative effort to identify opportunities in which the digital revolution can benefit people around the world, particularly the poorest and most marginalized groups (G8, 2001, 2007). Their main objectives were to enhance global understanding and consensus on the challenges and opportunities of ICT, and the role that these technologies can play in fostering sustainable, participatory development, better governance, wealth creation, and empowerment of local communities and vulnerable groups.

2.1.1 **Rural Area**

The term "rural" referred to different demographics for different countries. For examples, Estonia and Israel chose what most world consider traditional rural communities- mountain and desert town, Poland chose as one of its sites a research base in the Polar cycle. Sweden also chose a research station on a mountain side and the United Kingdom picked a "rural" business park as one of its participating sites. Thus, the definition of rural was challenged in each country, but the findings were similar across all demographics. Most spoke primarily about the educational opportunities, economic opportunities and the participatory opportunities (i.e. government involvement). Most countries primarily referred to these facets no matter what the term "rural" denoted (Henrik, etal, 2007).

Furthermore, the life condition of the rural community largely depended on the country and type of rural community (desert, mountain, research, etc.). For example, numerous "research base" in rural areas were used, and thus the technological infrastructure was quite strong. The life of the rural communities largely dictated the user needs. However, as there was large and diverse sample of countries involved in the user needs analysis, the needs over the range and scope of countries, turned out to be quite similar.

2.1.2 **Challenges of Digital Divide in Rural Areas**

Conradie and Jacobs (2003) cited in Olabode, Marlien and Jacob (2005) that the final report of the ITU-D Focus Group 7 of the International Telecommunication Union (ITU) (2001) and Mwanjok (2002) the matter is clearly more complex and

there are many technical and social challenges, which need to be considered. The following typical challenges exist, (Mwanjok,2002) that:

- Lack of electricity supply in the rural areas.
- Lack of supporting technological infrastructure in the rural areas..
- Lack of Personal Computer (PC)-related skills in the local rural communities.
- The scarcity of technical staff.
- Low level of economic activity mainly based on agriculture, fishing, handicrafts, etc.
- Underdeveloped social infrastructures (health, education, etc.).
- Lack of ICT policy
- Lack of awareness/understanding of ICTs
- High cost of hardware/software

However in support of the above, Erwin and Taylor (2004) cited in Olabode, et al (2005), that certain social key elements in ICT adoption that also need attention and commitment are: ICT competency as an essential skill, trust, collaboration with civil society, government and business sectors, perceived relevance, information granularity, spatial dimension and assessment, policy and research.

Therefore, given the above problems, the probability of rural communities being provided with ICT appears to be remote. Nonetheless, this study aims to evolve a public sustainable provision of ICT in the rural communities of Garun-Mallam local government.

According to Bala, Songan, Khairuddin, Harris, and Khoo, (2002), the challenges that are faced in using ICTs for bridging the digital divide are largely related to the following aspects:

1. Costly infrastructure, connectivity and use
2. Language of resources
3. Coordinated approaches and skilled human resources
4. Awareness of development in ICTs among rural communities

Therefore, on basis of the above challenges, Bala et al (2002) it appears that these challenges are really affecting social, economic and educational development for the rural masses. However, if the technological infrastructures and internet facilities are expensive, then access to internet for the rural communities will become a great problem. At the same, problem of internet technology application skills are increasing because of the absence of ICT training in the rural communities and most of people living in the rural areas does not good knowledge background and lacking English language grammar. Furthermore, there is no good ICT awareness among the rural communities as a result of total absence of rural initiative (Community Information Centre) and national guideline for ICT policy. The Government of Nigeria in general, has not making any effort to promote IT across the nation, despite the fact that there is national policy for information technology with the vision statement of "To make Nigeria an IT capable country in Africa and a key player in the information society by the year 2005, using IT as the engine for the sustainable development and global competitiveness (NITDA, 2000) as one of the major components of its drive to

fully developed nation status by the year 2005, but yet nothing has been achieved up to this era. Even though IT is the subject of a popular song frequently heard on the radio, which indicates a wholesale national commitment to IT, it was surprising, and a little alarming, to discover an entire community have heard little of such developments.

Moreover, at the project's outset, there was no evidence to indicate the existence of specific programmes for rural IT. Alongside the absence of awareness of IT at community level, it also appeared that there is little understanding of the potential for IT-induced rural development among community representatives. While such understanding is only recently emerging world-wide, and many questions remain to be answered regarding the value and sustainability of IT-related benefits for the rural poor, it might be expected that Nigeria positioning in the forefront of IT for national development could have ensured that community representatives are better informed about IT and their applicability within communal rural settings as well as proper implementation of such policy which introduced by the government of Nigeria in 2000 (NITDA, 2000).

2.2 **Digital Divide Effectiveness**

Research into the digital divide is maturing and has produced more useful insights into what it means and signifies. For example, we have evolved beyond the notions of the digital divide as a bipolar division between haves and the have-nots and the connected and the disconnected, (Corlane and Evan; 2008). However, they suggested the theory explain that how countries can respond effectively to challenges and opportunity to exploit the available and affordable technologies, which is called diffusion of innovation theory which depicts how

innovation permeates through a particular social system. The diffusion of technology, concerning who has access, and how ICT is harnessed is a concern for developing countries as a whole.

The level of ICT diffusion is an important measure of the reduction of the digital distance between developed and developing countries and represents the starting point of the effective use of technology. Empirical evidence suggests that adoption of technology impact the rate of diffusion and will create advancement. However, there are several critical antecedents such as technical compatibility, technical complexity, and relative advantage (perceived need). Dewan and Ganley et al (2005), contend that ICT spending is highly correlated with levels of development and ICT investments are associated with higher output in developed countries; however, this level of investments is not (yet) productive in developing countries. Dewan & Riggins (2005), proposed a direction, for digital divide research that included areas of ICT innovation, ICT access and ICT use which they called the ICT Adoption Cycle. This represents the preliminary levels of my framework. Access and use of technology are the foundations upon which technology can produce tangible benefits. Beyond access and use are technology innovation and transformation which can translate into future benefits.

World Bank, (1998) was cited in Peter, Khairuddin, Alvin, Jayapragas, and Hushairi (2004), recommends a systematic approach to the application of ICTs to the needs of rural communities. In order to support ICTs adoption that will contribute to rural development, it is essential to begin with the needs of the rural community. As a first step, a feasibility study is required in order to:

- Identify the needs and priorities of rural communities for such areas as agriculture, education, commerce, natural resource management, health and the like.
- Determine the types of information needed to help meet those needs, including information gathered from the rural population and transmitted to policy-makers and project designers, and information shared among rural communities.
- Determine the gaps between the information currently available and what is needed.
- Determine how ICTs can close those gaps and build valuable synergies by mobilising information across sectors.

2.2.1 **The Need for Digital Opportunity**

The need of the hour is to bridge this gap between urban and rural in Garun-Malam need to be created primarily due to the rise and dominance of Information Technology in urban areas Today the society is confronted with a digital opportunity, a chance for the disadvantaged groups to leapfrog ahead to equality in a short time, a few years, instead of going through the decade's long social evolutionary process (Pandey, Goel & Gangal, 2008) .We need to empower people with access to computing and the Internet and create a bottom-up uprising across Garun-Malam which will open up people eyes, especially the young, to the new ideas and new worlds. Digital opportunity will make people learn new skills, which could be bound in a numerous of different areas.

Time has now come to take computers and allied technological infrastructures to every village and to every country across the world. Only through such a mass-scale deployment we can create a stage on which can be layered other programs whose power can now be enlarged vividly. From primary education to adult literacy, from providing a two-way flow of information to enabling transactions, from increasing governance transparency to reducing corruption, from jobs to marriages, computers can indeed be the manna for the world's villages (Pandey et al, 2008). By themselves, computers will do little. They need applications to make a difference. They need change in governments processes. But by making computing available to every citizen, they will force a seismic change through the lines of governance. They will become the platform which can be built upon to layer a whole range of different services. Computing as a utility in every village will fulfil the vision of transforming Rural Community not only in Garun-Malam local government, but the country in general.

The time for incremental modernization is over. Garun-Malam needs creative solutions to start a revolution which can take its villages fast forward in time - creating them socially, economically, emotionally and of course educational sustainable units and growth engines, connecting the power of the villagers and opening up new prospects with the promise of a better tomorrow. One needs to understand that digital divide cannot merely be eliminated completely by merely putting up wires and boxes in all the villages in India. Digital divide has to be seen from a broader spectrum (Pandey et al, 2008).

Below figure gives a broader view of services which Internet can provide.

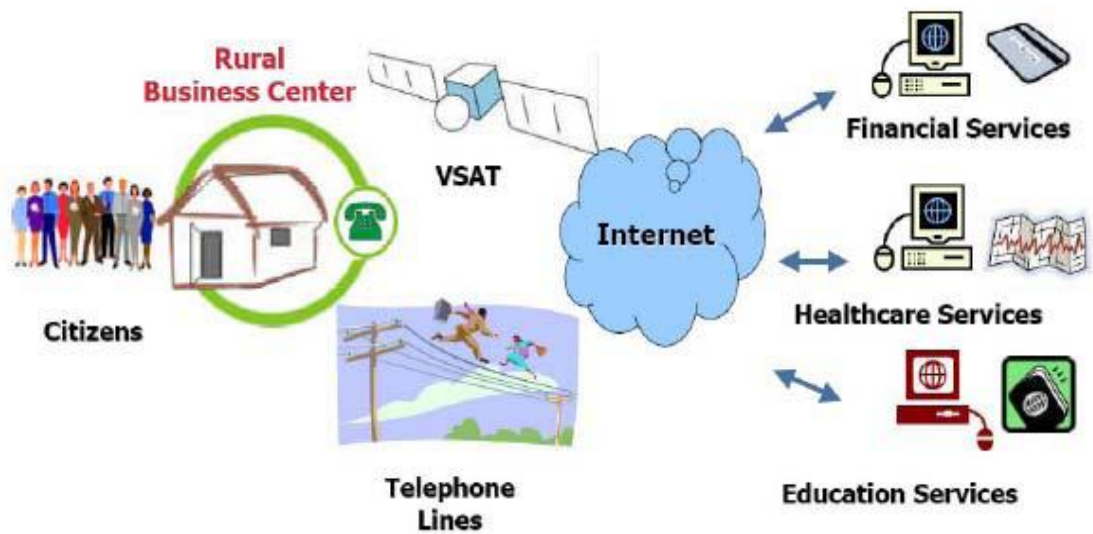


Figure 1. Services which can be provided by Internet in rural areas

The need of the hour is bridging the digital divide and bringing about a revolution which will take rural of Garun-Malam local government fast forward in time and be at par with urban area and the country at large. Digital Divide should not be considered as a problem but an opportunity to progress at a very fast pace as compared to the urban counterparts. The information technology rich has more chance to gain more information resources and information wealth than the information technology poor. Rural residents are in the disadvantageous position of information technology, the more information technology developed, the wider the gap between urban and rural expanded (Jian and Zhijin, 2011).

Kasusse (2005) said that, a large number of governments and aid organizations are taking positive steps to bridge the digital divide. However, initiatives from business are required too, because business driven activities have great potential as part of development strategies. The emerging economies need to develop their own digital industries that can catalyse the growth of business, government,

health and education infrastructures. Most big African cities are now mushrooming with Internet cafe's, the digital revolution seems to deepen the gap between urban and rural communities. Nevertheless, if developing countries fail to keep up with current IT trends and if global market forces are not regulated, the global digital divide will become worse (Kasusse, 2005). It is an enormous and difficult challenge to try to bridge this divide. Though, we know it takes money, it takes education and skills, and it takes prioritizing. Internet access to information is crucial in human resource development to empower people to take their destiny into their own hands, and IT is crucial for future access to information. Consequently, IT and Internet access are crucial factors in any strategy of development by people to empower the poor in both urban and rural communities.

Poor people need to exchange information and participate in discussions in order to get new ideas and make better decisions. Bringing poor people in the rural areas to participate in the digital uprising has strategic importance. Of course, IT is not a luxury, it's a necessity for basic life needs; poor people can benefit directly from these technologies (Kabir, 2009). For now, it is so urgent to provide remote and rural areas of unequalled development opportunities by strengthening the ICTs construction of rural areas fully and enthusiastically use the characteristic of information diffusivity and network hyperspace (Edwin, 2008).

2.3 **Bridging the Divide**

Nabil (2004) says that it may not be possible to bridge the divide, but it is important to prevent it from deepening, as a minimum, and to attempt to narrow it

as much as possible. A collective action approach is required both within countries and among countries to achieve this target. Within countries, collaboration of government, private sector and NGOs is required, while among countries, advanced and developing countries should cooperate, the former advancing financial and technical support. Digital enhancement in developing countries increases advanced countries' market share, and developing of the "divide" should be seen by all as a global issue that could finally threaten world political and social peace if proper attention is not given to.

Furthermore, this means that national, state and local action should focus on three frontlines: improving physical communications facilities, improving sharing of knowledge and information (and this can be achieved through increasing global and social networking) and constructing digital prospects (Nabil, 2004). In this regard, governments should develop national ICT strategies and frameworks and the ICT should be seen across the country as a sector by itself, similar to ministry, agriculture, tourism, and so on. There should also be documentation of detailed applications of ICT in the economic and social sectors and it should be supported through the cooperative effort of government (local, state, and national), professional IT-investors, community leaders and NGOs. Moreover, these bodies should try to provide basic skills through constant training of hardware, software, digital literacy and building digital prospects. Governments should commit to enhancing the development of the communication infrastructures, to its participation in new international policy and technical issues raised by ICT, and to establishing policies and the physical and regulatory environment within which new technologies can improve internet connectivity,

increase access, lower cost and make access to internet relatively cheap. Rural and remote areas should benefit from universal access and must not be marginalized (Nabil, 2004)

In (2005) Kasusse said that a large number of governments and aid organizations are taking positive steps to bridge the digital divide. However, initiatives from business are required too, because business driven activities have great potential as part of development strategies. The developing economies need to develop their own digital diligences that can catalyse the advance of business, government, health and education infrastructuresKasusse (2005). The Internet industry in Europe and America was created by a large number of entrepreneurs, encouraged by a culture of innovation. Governments played only a minor role in this revolution, because the necessary infrastructure was already available to businesses, and because the blow-out knowledge took place so fast that it took universities several years to catch up Kasusse (2005). The same will be the case for emerging economies. That is why starting new entrepreneurial businesses and creating a supportive knowledge sharing culture is the most significant contribution that will make to bridge the digital divide and ensure that these markets are not left behind.

The government of the Republic of Korea played a leading role in the development of IT infrastructures' in the country. This effort made by the government of Korea has since resulted in the establishment of a technological base supported by a sophisticated micro-electronics industry leading country to leap frog in to the information era. Furthermore, concerted efforts of the government, the private sectors, academia and the civil society were required to

successfully develop IT in the country(Byung-Sam, 2009). This role had several dimensions which included relevant ICT policy and legislation formulation; establishing an institutional framework incorporating e-government; promoting research, development, education and training; establishing close partnership with the private sector; and undertaking ICT popularization through understanding and awareness campaigns among the population. The private sector actively participated in the discussions, formulation of policies and strategies and their implementations. The public/private partnership along with active participation of the population was one of the prominent features of national efforts in building the information society and bridging the digital divide, (Byung-Sam, 2009). From 2006, a consortium consisting of the Ministry of communication and information, local government and the Korean Telecom took the responsibility for the construction of broadband Internet Infrastructure, specifically in the rural areas.

Similar research was done in Bangladesh; the ICT status of Bangladesh is not remarkable without some favourable initiatives by the Government and by private entrepreneurs. The Internet came in Bangladesh in 1993 and IP connectivity in 1996. In April 2000, the Government withdrew taxes on VSAT after that, the use of internet scenario of the country changed rapidly. According to Anwarul and Keita (2010) mentioned that in Bangladesh initiatives for reducing the digital divide have already been taken and a number of institutions have established their network to work on it. It must also be mentioned that at the end of the year 2009, WiMax technology was introduced in the country which is enabling fast, secure and dedicated internet connection for all and is also breaking the barrier of not

reaching the unreached (Wahed, 2009). However, all the ministries and divisions in Bangladesh are on their way to provide information services electronically under “Quick Win” initiatives through ICTs. Community people of rural areas in Bangladesh are not getting the ICT facilities as in urban areas and most of the government initiatives are city-based. However a lot of private initiatives have been played a vital role across the country to reduce the gaps (Anwarul and Tsuji, 2010).

Besides these, Anwarul and Tsuji (2010), said that several attempts have been taken to reduce the digital divide for rural people such as Youth Community Multimedia Center (YCMC), Rural Information Resource Center (RIRC) under Community Development Library (CDL), Digital Equality Network (DEN), Digital Knowledge Foundation (DKF), Grameen Telecom, International Rice Research Institute (IRRI), School Net Foundation Bangladesh, Sustainable Development Networking Foundation (SDNF), WIN Incorporate, Young Power in Social Action (YPSA) etc. are mentionable. These initiatives always indicate an increment of the usage of ICT Services in Bangladesh.

It is good news for rural communities that nowadays different steps are taking shape and interest groups are coming up with their own interpretations and agendas. Broadly speaking a digital society ensures an ICT driven knowledge-based society and in order to build a digital society it needs to reduce the gap between information rich and poor in the community. It needs to build a system where information will be readily available online and people from different community of the local government will avail themselves of the information through different channels (Wahed, 2009).

Wijewardena (2002) points out that, in order to bridge the digital divide, a clear understanding of the underlying causes of the digital divide is necessary for the development of policy prescriptions. That is, the success of any policy prescription to narrow the digital divide will largely depend on the extent to which that policy prescription will deal effectively with the underlying causes of the digital divide. Caspary and O'Connor (2003) mention that reaping the potential benefits of the Internet presumes that the problem of affordable and low-cost access in rural areas and other low income communities has been resolved. In addition to the question of cost, the problem of quality of access should not be underestimated, especially in the remote areas of developing countries. Cables tend to be in poor repair, and international access to Internet is often very limited. The nearest server may well be farther than a local phone call away. A combination of such factors tends to make Internet access very slow and costly in those areas. On the surface, the problem of bridging the rural-urban digital divide does not appear to be too difficult. It seems as if all that would be required is to go to a number of such underdeveloped rural areas and to provide and install the necessary information technology infrastructure and equipment that has been lacking there up to now. However, Conradie and Jacobs (2003) stated that unfortunately, there are many examples of well-funded rural development initiatives in Africa that have proceeded from this premise, but that have failed to provide any meaningful benefits to the local communities involved. Conradie and Jacobs (2003) conclude their findings by highlighting the importance to realise that ICT usage cannot be seen as a stand-alone sustainable activity in the rural environment, but rather as an activity in support of something else (for example promoting education, health, or government information

actions). They particularly pointed out the importance to consult with the community to determine what local activities need be supported by ICTs, and to get support from the community leadership for any training or other actions involved in the initiative.

2.4 **INTERNET ACCESS**

2.4.1 **Access to Divide**

A lack of access to the Internet is a major element of the digital divide. Research consistently identifies ethnicity, income, age and education as significant predictors of access to technology (France and Lemuria, 2006). Therefore, the issue here is that by given total access of internet to the rural communities, the socio-economic, education and political factors which the communities will surely be eradicated. Despite the fact that there is a great in-equality that exist between urban and rural communities in terms of internet access so as to reach the global information, yet effort has not been made bridge the long existing gap. In-equality in terms of social, economic, education and political predominant. The presence of all these types of inequality in current digital divide research shows that classical sociological concepts of inequality could still serve as a background.

Developing countries and non-privileged groups have difficulty in “connecting” and difficulty in using IT effectively because of anyone or more of the following: illiteracy, poverty, low level of skills, highcost of access, and even, poor mastering of the English language. The divide is actually growing at an exponential rate. Also the deepening of the digital divide is in turn deepening the “development divide” among communities and within state. This could eventually threaten political peace among local government communities

and societal peace within the state level and the nation in general. Decision makers in most of the local government and the state are somehow skeptical or unaware of the contribution that ICT can make to develop. Priorities are put on other basic development needs such as road rehabilitation, agriculture and political campaign, but not on ICT development.

The question here is that "can digital divide be bridged? According to Nasir (2004), he said that it may not be possible to bridge the divide, but it's important to prevent it from deepening, as a minimum and to attempt to narrow it as much as possible. Therefore, a collective effort is required both at local government level and the state to achieve this target. Domestic and global action should focus on three frontiers: improving physical communications, enhancing sharing of knowledge and information (through increased of global and social networking), and creating digital opportunities (Nasir, 2004).

2.4.2 Access to Whom

A brief answer to this question is easy - access for all, at least for all citizens who need and wish to make use of the community information centre. To the extent that network services are valuable, no one should be excluded from the opportunity of participating in their advantages. Furthermore, the benefits for everyone expand as more people become reachable through the network. According to Borenstein notes (1998) "the utility of digital networks appears to rise exponentially with the number of interconnected users." However, not all citizens are alike and we need to recognize the diversity of people and their particular access needs (Clement and Shade, 2000). In part this involves recognizing the obstacles to access that are characteristic of various

‘populations’, most notably age, gender, income, education, disability, ethnicity, geographic location (urban vs. rural and remote), and nationality both developed vs. developing countries (Clement and Shade, 2000).

According to Hirschkop (1996) warns, unless all people have access to a range of network services, “instead of extending access to the one community (urban) the new technology will install a new form of communication apartheid”. Promoting universal access is not equated with making it imperative that everyone be “plugged in” as much as possible Hirschkop (1996) . The overriding objective is to ensure that everyone enjoys a range of communicative options suited to their particular life circumstances.

2.4.3 **Access Types**

According to Jan (2006) digital divide research started with the observation of the number and categories of persons who have a computer and network connection at their disposal. This is to say having a particular technological opportunity. The technological orientation of this early digital divide research led to the equalization of media or technology access with physical access. However, since the year 2002, an increasing number of researchers suggests to go ‘beyond access’, to reframe the overly technical concept of the digital divide and to pay more attention to social, psychological and cultural backgrounds (Jan, 2006).

Jan (2006), highlighted material access, motivational access, skills access and usage access as four major types of access.

Material Access

The largest part of digital divide research is devoted to the observation of divides of physical access to personal computers and the Internet among demographical categories that are obvious in this respect: income, education, age, sex and ethnicity. The first nation-wide surveys in the developed countries at the end of the 1990s and the turn of the century all showed growing gaps of access between people with high and low income or education and majority ethnicities as compared to minority societies', Jan (2006). With the declining costs of computer equipment in recent years the importance of income has been somewhat reduced but it remains the most important factor for material access because total computer and Internet access costs (peripherals, printing costs, software, subscriptions and connection costs) barely diminish. In poor countries lack of income remains the decisive barrier, Jan (2006).

Motivational access

According to Jan (2006), many of those who remain at the 'wrong' side of the digital divide have motivational problems. With regard to digital technology it appears that is not only those that do not have, but also those that does not have any interest because of the absence of motivation access. In the age of the Internet publicity this was a much abandoned phenomenon. Research among non-users and the unconnected is relatively occasional. German and American surveys (ARD-ZDF, 1999a and NTIA, 2000) were cited in Jan (2006) and stated that the main reasons for the refusal to use computers and get connected to the Internet were:

- No need or significant usage opportunities;
- Rejection of the medium (the Internet and computer games as ‘dangerous’ media);
- lack of capital;
- lack of skills

The factors explaining motivational access are both comprise of social, cultural and a mental or psychological nature. A main social explanation is that “the Internet does not have appeal for low-income and low-educated people”, Jan (2006).

Skills access

However, after having acquired the motivation to use computers and some kind of physical access to them, one has to learn to manage the hardware and software. Computer information or ‘multimedia literacy’ and computer skills or ‘information capital’. Steyaert and Dijk (2005) was equally cited in Jan(2006) and introduced the concept of ‘digital skills’ as a succession of three types of skill. The most basic are ‘instrumental skills’ or ‘operational skills’, the capacities to work with hardware and software. These skills have acquired much attention in the literature and in public opinion. The most popular view is that skills problems are solved when these skills are mastered.

Van Dijk (2005) proposes a comparable distinction between ‘information skills’ and ‘strategic skills’. Information skills are the skills to search, select, and process information in computer and network sources. Two types of information skills are required: formal information skills (ability to work with the formal characteristics of computers and the Internet, e.g. file and hyperlink structures)

and substantial information skills (ability to find, select, process, and evaluate information in specific sources following specific questions). Strategic skills can be defined as the capacities to use computer and network sources as the means for particular goals and for the general goal of improving one's position in society (van Dijk, 2005). The general impression of these skills investigations, both surveys and tests are: (1) that the divides of skills access are bigger than the divides of physical access and (2) that, while physical access gaps are more or less closing in the developed countries, the skills gap (in particular, regarding information skills) tends to grow. A striking result is that those having a high level of traditional literacy also possess a high level of digital information skills (van Dijk, et al. 2000). These skills appear to be more important for computer and Internet user than technical know-how and the capacity to deal with numerical data.

Usage access

According to Jan (2006) says that the actual usage of digital media is the final stage and ultimate goal of the total process of appropriation of technology that is called access. Having sufficient motivation, physical access and skills to apply digital media are necessary but not sufficient conditions of actual use. Usage has its own grounds or determinants. As a dependent factor it can be measured in at least four ways; usage time, usage application, broadband/narrowband and active or creative use.

However, Van Dijk (2005) observes 'the first signs of a usage gap between people of high social position, income, and education using the advanced computer and Internet applications for information, communication, work, business, or

education and people of low social position, income, and education using simpler applications for information, communication, shopping, and entertainment’.

According to Horrigan & Rainie (2002) usage of narrowband versus broadband connections appears to have a strong effect on usage time and on the type and range of applications. People with broadband connections take much more advantage of the opportunities of the new media. They are much less deterred by the costs of connection time; they use many more applications and for a longer time. A ‘broadband elite’ arises that uses the connection for 10 or more online activities on a typical day (Horrigan & Rainie, 2002). Finally, broadband stimulates a much more active and creative use of the Internet. Despite its image of being interactive, most Internet usage, apart from emailing, is relatively passive and consuming. Active and creative use of the Internet, that is, contributions to the Internet by users themselves, is a minority phenomenon (Jan, 2006).

A general conclusion from a number of investigations of usage is that, increasingly, all familiar social and cultural differences in society are reflected in computer and Internet use (Jan, 2006).

2.5 **Digital Literacy**

Digital Literacy is the awareness, attitude and ability of individuals to appropriately use digital tools and facilities to identify, access, manage, integrate, evaluate, analyse and synthesize digital resources and construct new knowledge/media, (Casey and Bruce, 2010). Research around the digital literacy is concerned with wider aspect associated with learning how to effectively find, used, summarize, evaluate, create and communicate information while using

digital technologies, not just being literate at using a computer. Digital literacy encompasses computer hardware, software (particularly those used most frequently by businesses), the Internet, cell phones, PDAs, and other digital devices.

Eszter (2005) defined skill as a user's ability to locate content on the web effectively and efficiently. Most existing research on people's computer-use skill focus more common than Internet-use skills in the literature draws on information about people's self-perceived skills instead of measures of actual abilities. The latest results of a survey conducted by (Garko, 2010), 113 respondents over the age of 18-25 showed that the digitally literate population in Kano Municipal has again increased over the share of the digitally illiterate is 63 %. Therefore, based on this analysis what do we think will happen in the case of rural community where a lot of people do not have internet access skills and digital literacy skills?

The communities could be large or small and people involved to some extent to go for work, school, stay at home or participate in a particular interest such as hobby or sport. According to Jones (2008) stated that people needs to be in a situation in order to acquire new skills or knowledge regarding digital age so as to provide themselves with global information that will increase their socio-economic and social standard. Therefore, ability to have the basics skill of internet technology applications is paramount for the development of rural communities.

UNESCO (2002) was cited in Jones (2008) that the main purpose of introducing computer in the rural area schools is to produce a new generation of skills; creative and innovative individuals who are able to use ICT effectively in

accessing and managing information from technology viewpoint. Therefore, on the basis of the above issues, the skills could be seen as providing people for all-round development with for individual capabilities and encouraging intellectuality with emotional spirit and physical growth. Furthermore, providing technological literacy workforce and encouraging educational sectors to offers equal access to learning opportunities/different learning techniques can equally be incorporated as digital learning skill process.

2.5.1 Causes of Digital Illiteracy in the Rural Areas

Unfortunately, people from the rural areas especially in underdeveloped or even developing countries to some extent are unequally educated or sometimes they are not receiving education at all, whether computer or general educations. However, for any nation that want its economy and social activity to grow better and compete with other developed countries, the rural area must have equal opportunities in terms of IT infrastructures and integrate them with ICT training in to their primary and secondary schools. Therefore, on the basis of this, Adeniyi (2007) conducted a random telephone survey covering six rural areas in Ekiti state of Nigeria. The results were highlighted as follows:

- Poor electricity supply.
- Total absence of rural area initiatives e.g. Community Information Centres.
- Socio-economic situation among the rural communities.
- Teachers were not trained to have basic skills of both computer and internet applications.
- Lack of financial assistance by both local and state governments.

- Absence of professional IT-investors.
- Lack of awareness and support from community leaders and other stakeholders.

In order to improve our understanding of "digital literacy" and provide professional designers of digital environments, and educators working with ICT with better guidelines for design digital literacy programme, there is a need to view some framework for the concept that is as in-depth, comprehensible, and tight-fisted as possible. In a digital literacy framework developed by Eshet-Alkalai (2004; 2005) suggested that information literacy is very paramount for a digitally skills society since information-literate has become a survival skill that enables learners to make informed use of internet technology applications. Moreover, socio-emotional literacy helps to acquire skill related to digital communication tools through identifying pretentious people in chat rooms. Users can acquire a relatively new kind of digital literacy. However, this socio-emotional literacy provides users with high level and complex internet application skills and ability to master new technological infrastructures.

2.6 **Digital Divide in Nigeria**

The Federal Government of Nigeria realized that the country was lagging behind in the race to become a digital society, and saw the potential of Information Technology (IT) to empower people – particularly, people with disabilities, women, youth and rural communities (Olabode ,etal 2005). Therefore, it declared Information Technologies (IT) a national priority, in the year 2001 (Bello, 2003).

Disraeli (2001:4), cited in Olabode, etal (2005) that the success of ICT projects in rural communities depends on sustainability and the deployment of suitable infrastructure. In other words, an IT-related project should consider local needs and local skilled staff, or the adequate training and development of the local people. If such projects still depend on foreign staff and skills, then it is not a case of the transfer of technology but of the "dumping" of technology that is often out-dated. This results in a causal relationship between technology “dumping” and technology transfer. One finds that the “dumped” technology that is out-dated is often provided to rural communities without the ability for community to use it. People in the community are not trained to use the technology or the hardware and software are so out-dated that it cannot be applied to the benefit of the community (schools, businesses or administrative offices).

2.6.1 Nigerian IT policy makers

Olabode, etal (2005) stated that the recommendation to Nigerian IT policy makers for harnessing the opportunities provided by IT and reach the objective of bridging the digital divide in disadvantaged communities; it is essential to note the following measures:

- Provide an enabling environment and improve social amenities, such as stable electricity, telecommunication infrastructure, etc.
- Encourage ICT inflow, reduced taxes, or subsidies on ICT infrastructures (hardware/software), legal support to disadvantaged community ICT centre operators, etc.

- Encourage the use of public institutions (schools, libraries, hospital's research centres, etc.) in introducing ICT, while private entrepreneurs are encouraged to set up public access in the form of cyber cafés.
- Reform national educational systems to embrace the use of ICT by learners and teachers alike. Create ICT research centres and training institutions.
- Encourage the implementation of e-government, e-education, e-health, e-commerce, etc. which will enhance the use of ICT for information access.
- Create public awareness and training to enable the public to make use of the services offered by ICT centres.

It is important and a matter of emphasis, to understand that social amenities, such as a stable Power supply, should have priority over all the other stated recommendations above.

2.6.2 Analysis of ICT provision in Nigerian Situation

Below is the summary analysis of ICT provision in the Nigerian situation, Olabode, etal (2005).

PROVISION	SITUATION
Model of provision	Private entrepreneur, Community Cyber Cafe's
Aims of Provision	Business purpose (to generate profit).
Government Policy	Deregulation of telecommunication industry, yet to implement Community Project Programme.
Infrastructure/Technology	Satellites, Wireless and Telephone.
Risk of Provision	Social infrastructures (electricity, road etc) and funding.

Management	Private ownership
Contents/Services	Information, communication, employment opportunities.
Funding	Personal savings, Bank loan.
Sustainability	Sustainable with medium degree of accuracy.

2.6.3 Digital Divide and ICT Status in Garun-Malam Local Government

As it is a nationwide initiative, the Internet access in Garun-Malam local government is facing a lot of different problems, which include the following, (Local government Annual seminar, 2007)

- Poor digital literacy rate: low literacy is a big problem in rural areas which also creates another problem to run any ICT centres.
- Lack of ICT skills: computer operating skills and internet navigation is still low in rural areas of Garun-Malam. Even though, there is no single rural information centres owned by government, almost all the internet cafe's both rural and urban communities were established by individual as business centre.
- Unawareness of modern technology: Majority of the rural communities of Garun-Malam local government lacking awareness of new technology and information systems. That is why it has come out that some people are indifferent about the information centres.

- Absence of national policy: it is not possible to make the programme successful without supporting a private telecommunication company and that is why the government should come forward and provide all facilities to run the project.
- Lack of power supply: it is an indispensable problem to building a digital Garun-Malam as the country is facing huge electricity problems. An unreliable supply of electric power is another barrier of providing ICT-based services to the community people.
- Insufficient bandwidth: it is really challenging to run the internet services with GSM technology as it becomes old. Insufficient bandwidth is hampering the provision of faster and effective services to the user community.
- Financial constraints: it needs money, land, and educated and trained manpower to build an Information Centres (internet cafe), and sometimes entrepreneur feel reluctant to invest. Besides these, internet browsing charges and other service charge seems too expensive to the internet users.
- Lack of government initiatives: in the part of government, there are a lot of responsibilities. The community information centres' can't survive without guardianship and help from the government. The local government of Garun-Malam and the Kano state government did not take any initiatives to establish community information centres' due to low budgets and political differences. Information provision is one of the lowest priorities in the local government.

2.6.4 Garun-malam Internet Infrastructure Growth Since 2008 to-date.

Service	Year			
	2008	2009	2010	2011
Internet Access Service Providers	1	-	2	-
Wireless Access/internet/e-mail subscribers	-	-	2	5
Dial-up internet/e-mail subscribers	20	11	56	-
VSAT International data gateways	-	-	-	-
Public Internet Service providers	-	-	3	2

Source: State media and Publication Company, August, 2011

2.1.1 Internet Education (ICT Training) and Provision of Pcs in Garun-Malam Local Government.

	2008	2009	2010	TOTAL
NO. Of people educated (trained by the local gov't.)	250	255	180	685
NO. of PCs	40	47	30	117

Source: Information unit, Garun-Malam local government.

2.7 Summary of the Chapter

The chapter discussed various studies and viewpoints of the researchers concerning issues pertaining digital divide and its associated concepts. Internet access and digital literacy were also discussed that will give aid to this study. Furthermore, the researcher was able to review the literature concerning the growth of Internet infrastructures and the ICT training of Garun-Malam local

government. More literature was also discussed related to digital divide and its effectiveness in Nigerian context.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

Methodology provides a framework and a guideline for a research on how to accomplish his/her task. It is the centre of any research endeavour. Thus, methodology outlines and stipulates how the research objectives will be realized. In this section, Pilot study, the research design, instrument design, questionnaire, hypothesis, method of data collection, population of the study, sample size and sampling techniques, data analysis and result presentation method will be elaborated comprehensively for easy and clear understanding.

3.2 Research Design

The purpose of research design is to make sure that facts obtained allow the researcher to analyse the results of the questionnaires and test hypotheses. Therefore, this research employs a cross-sectional survey design; that is data was collected at one point in time. The survey research design is a suitable means for assessing opinions, social facts, belief, attitude and trends (Kerlinger, 1973). Also, survey design is a good way of measuring the relationship between variables (Punch, 1973). This study is concerned with how variables are associated, the quantitative survey is used. More so, the unit of analysis in this study is the individual, i.e. each individual response is considered as an independent data source, since the survey having the individual as a unit of analysis are the most generally used (Punch, 2003). The data collection procedure is based on the self-administered questionnaire. According to Punch (2003) this

type of data collection method is generally the most commonly used in quantitative survey study.

3.3 Instrument Design

It is important that for survey research that choice have to be made about questionnaire wording, response scale (especially for attitudinal questions), question context, and data collection technique. However, it should be clearly acknowledged here that the methodological research into reliability and validity of data resulting from attitude measurements is of substantial significance for instrument design (Meyburg and Metcalf, 2008).

Question formulation is very much dependent on the objectives of the survey and the target population to be surveyed and this is very fundamental, survey planning considerations give rise to decisions about the most appropriate survey method to be employed, which, in turn, determines the most suitable instrument design (Richardson & Meyburg, 1995). According to Meyburg and Metcalf, (2008), suggest that there are five basic items to be considered when designing instrument:

- relevance of the questions,
- language simplicity,
- vague words,
- loaded and leading questions, and
- Sensitive questions.

Therefore, below is a table described the actual sources of the questions designed in the questionnaire for this research study.

S/NO	ITEMS	SECTION	ITEMS TYPE	SOURCE
1.	Questions 1-to-4	Section A	Demography	Sofia and Caroline, (2010)
2.	Questions 5-to-10	Section B1	Internet access	Salaam and Adegbore (2009)
3.	Questions 11-to-15	Section B2	Internet access	Self- formulation
4.	Questions 16-to-30	Section C	Internet technology literacy	Jones, G.B. (2008)

3.3.1 Questionnaire

The questionnaire contained 30 questions with multiple choices in nature. Prior to distributing the questionnaire, 3 senior colleagues (PhD candidates) and experts in the field went through it for proof reading, checking for errors and cases of misinterpretation. However, their views and suggestions for improvement were included in the questionnaire. This gives the questionnaire to be clearer, precise and easily understand by the respondents.

The questions were specifically tailored in order to answer the research questions comprehensively and shed more light on any other related information on the internet and internet technology literacy. The title of the questionnaire was clearly and precise and it informed the respondents the purpose of the research and requested them to participate. However, due to the nature of the peoples of the research area, majority of them are farmers and business men, therefore 150

questionnaires were distributed to the selected people that are literate to avoid damage/misused of the questionnaire.

3.4 Hypothesis

Hypothesis is a specific statement of prediction. It describes in concrete (rather than theoretical) terms what you expect will happen in your study (William, 2006). Your prediction is that variable A and variable B will be related and you don't care whether it's a positive or negative relationship. Therefore, based on the scope of this research, below are the hypotheses used to describe the relationship of the variables.

H₁ There is no significant relationship between Internet technology literacy and Access to Internet services.

H₂ There is no significant relationship between Internet Access and age.

H₃ There is no significant relationship between Internet technology literacy (application) and IT infrastructures.

H₄ There is no significant relationship between Internet access and services provided by Internet Service Providers (ISP).

3.5 Method of Data Collection

A questionnaire was designed and distributed to the respondents. One hundred and fifty questionnaires were distributed across the four rural communities of Garun-Malam local government which includes Garun-Malam, Chiromawa, Yadakwari and Grun-Babba. This gives guidance and support for constructing the effective analysis and recommendations for bridging the divide. 148 were collected back from the respondents which exactly met the target number. The

questionnaires were pre-tested pilot study among 25 respondents to test their understandability and workability.

The use of Questionnaires gives this research an edge because of the following advantages; it is fairly easy to analyse feedback, most respondents are familiar with the format of the questionnaire, it is also easy to administer to a large pool of respondents with little effort, respondents can complete it quickly and more importantly, respondents have sufficient time to think over the answers.

Questionnaires can either be open or closed, but this research employed an open questionnaire approach. The questionnaires were collected back by the researcher and analyse the result from this collected data in order to find out the accessibility/Internet technology literacy level and how it can be improved.

3.5.1 Pilot Study

In order to get accurate results of this research, the researcher have put great attention by evaluating validity and reliability. Thus, Michael (2002) mentions that the four evaluation research factors are important to ensure objectivity of the research, these include; Validity has been used by carrying out a strong analysis and providing support towards the efficiency and richness of the questionnaire. Reliability has been enhanced by revising data repeatedly to ensure consistency and accuracy.

However, 25 sample questionnaires were distributed to the respondents in order to check the reliability of the questions. The researcher used SPSS to check the overall reliability of the questionnaire. According to our initial results, some questions were

removed due to a negative average covariance among items. There are three group items in the questionnaire and below are results of Cronbach's Alpha for each group.

Group items 1.

Cronbach's Alpha	N of Items
.595	6

Thus; the group item 1 is average but it can still be acceptable. Reliability analysis to examine the internal consistency of the questionnaires obtained where a Cronbach's alpha coefficient at 0.5 or higher was considered acceptable (Kerlinger and Lee, 2000). Further, An Alpha of 0.5 or above is considered as an indication of good internal consistency (Bowling, 1997). Whereas an Alpha of 0.7 or above is considered as satisfactory (Howitt, 2003). Nevertheless, according to Jenkinson et al (1993) an alpha result of over 0.5 is acceptable. Therefore, based on the above literature, the result of group item 1 is consistence and measurable and the questions will be used for this research.

Group items 2.

Cronbach's Alpha	N of Items
.782	5

Group items 3.

Cronbach's Alpha	N of Items
.831	15

Generally, reliability coefficients below 0.5 are seen as unreliable, measures between 0.5 and 0.7 are modest, and levels of the Cronbach's alpha above 0.7 indicate acceptable levels (Boerman and Kattenberg, 2011). Therefore, all the three group items in the questionnaire are very reliable and acceptable.

3.5.2 Population of the Study

In accordance with Thomas (2003) who notes that the overwhelming majority of research studies are conducted based on convenience or availability sample, data for this research was drawn from a population of 150 respondents from the selected sample areas of Garun-Malam local government. The population of this research are the resident of four rural communities of Garun-Malam local government (which includes; Garun-Malam, Chiromawa, Yadakwari, G/Babba,) irrespective of gender, level of educational background and occupation. Even though, much emphasis has been given to the rural communities of Garun-Malam Local government, since this study focuses on bridging the digital divide in rural communities by determining the Internet access and Internet technology literacy level and provide sound and sustainable recommendations for improvement.

3.5.3 Sample Size and Sampling Techniques

A sample size is group of the target population studied or the purpose of generalizing about the target population (Creswell, 2008). Therefore, to fully represent the different stratum of the population and to enable generalization,

Area sampling will be used to select the sample. This Area sampling does not rely on a population frame and therefore is a good choice when the population is large (Sekaran, 2000). However, the population of this research will be divided into four geographical locations, i.e. across the selected communities within the Garun-Malam local government. A total of 150 respondents drawn from the four division of the whole population is the sample size.

3.6 Data Analysis

The first step is to sort the collected data into a range of categories. Facts and figures are then obtained for analysis; Interpretation of the result of the analysis should be highly objective. However in some instances, data obtained from respondents tends to be subjective, special care should be put in consideration when interpreting this result to retain quality. Data analysis is a very sensitive process (Strauss & Corbin, 1990). It will involve the following several steps.

- Data cleaning which aids to inspect and if need be, correct erroneous data.
- Initial analysis in order to carry out data quality assessment.
- Primary analysis to check whether research questions have been answered.
- Final analysis to add extra information and to create a conclusive report.

The analysis of the data will be by means of SPSS statistical software package. However, descriptive statistics were adopted to examine the frequency, measurement and relationship between the variables. More so, the data to be collected are quantitative in nature, because the analysis of this quantitative data entails a process of summarizing and distilling data in order to arrive at a

substantive conclusion about the way variables are related to each other (Punch, 2003).

Furthermore, according to Punch (2003) stated that analysis is carry out in three successive stages; the first stage is data must be cleaned, codified and summarized for easy and simplicity, then followed by descriptive analysis of the demographic features of respondents and test using Cronbach alpha to ascertain the reliability of data. Finally, Correlation and multiple linear regression for the actual relationship for the variables.

3.7 Result Presentation Method

The researcher uses tables, and diagrams (Bar chat) to best describe, tabulate and represent the research finding. Theseare combined only in the presentation of data of demography, while the main analysis will be both tables with precise and comprehensive text explanations thoroughly to elaborate more on the research finding for better understanding and clarification.

3.8Summary of the Chapter

The chapter outlined and stipulated how the research objectives will be realized. It explained how the pilot study conducted and the process of the reliability and validity test concerning the questionnaire used for this research.

CHAPTER FOUR

FINDING AND DISCUSSIONS

4.1 Introduction

This chapter presents and analyses the results obtained from 148 respondents of the sample size. As mentioned in 3.9, the researcher uses tables and precise text explanation to best describe the research finding for better understanding and clarification. The bar charts of the demography and other variables will then be presented in the appendices. The results will be presented in three sections as it appeared in the questionnaire, i.e. demography, exploring internet access level and measuring the internet technology literacy level. However, hypothesis will be tested using correlation to determine the relationship.

1.2 Demography

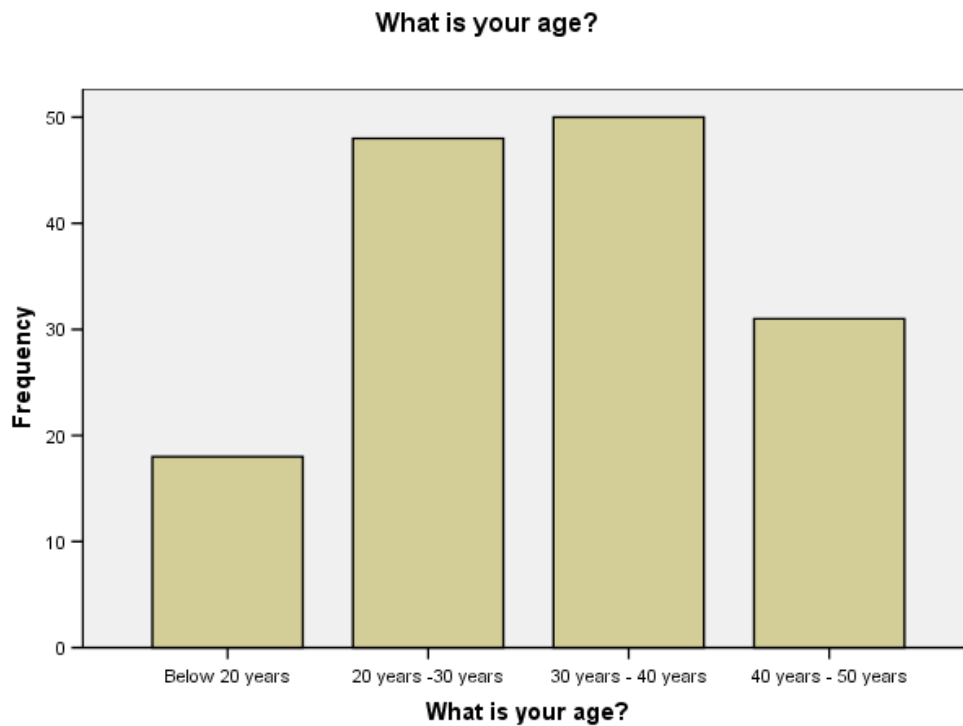
The descriptive analysis of the respondents' demographic characteristics is presented. Furthermore, demographic profile includes the age, gender (Sex), occupation and highest educational qualification of the respondents.

4.2.1 Age group

Table 4.1: Descriptive statistics analysis of the Age of the respondents

Option	Frequency	Percent	Valid Percent	Cumulative Percent
Below 20 years	18	12.2	12.2	12.2
20 years - 30 years	48	32.4	32.7	44.9
30 years - 40 years	50	33.8	34.0	78.9
40 years - 50 years	31	20.9	21.1	100.0
Total	147	99.3	100.0	

Highest number of the respondents were in the age of between 30 years to 40 years which is 33.8% (N=50), between 20 years to 30 years is 32.4% (N=48), between 40 years to 50 years is 20.9% (N=31), below 20 years is 12.2% (N=12) and above 50 years is 0.0% (N=0). Figure 1. Illustrate the age of the respondents using bar chart.

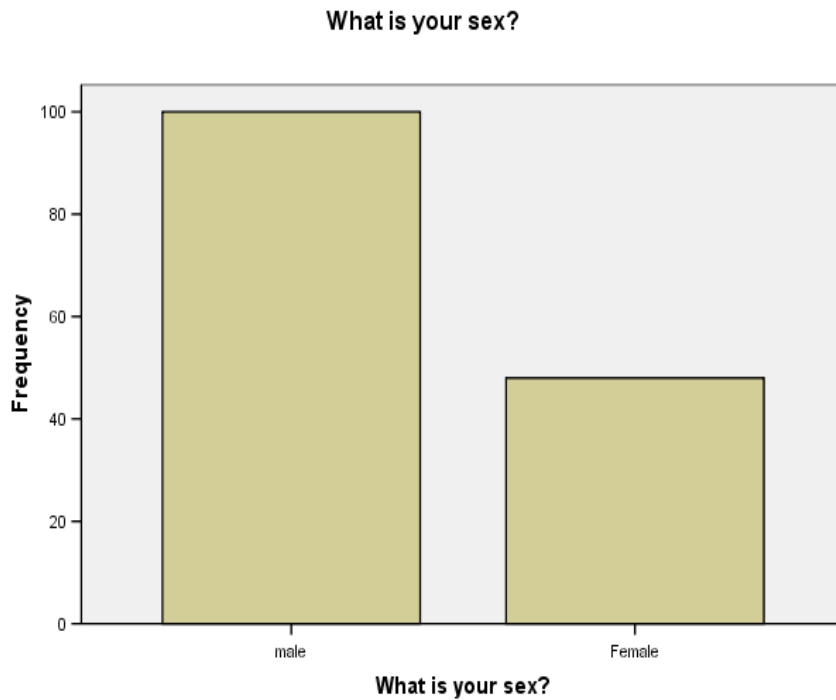


4.2.2 Gender

Table 4.2 Descriptive statistics analysis of the Gender of the respondents

		Frequency	Parent	Valid Percent	Cumulative Percent
V a l i d	male	100	67.6	67.6	67.6
	Female	48	32.4	32.4	100.0
	Total	148	100.0	100.0	

Given that 147 respondent 67.6% (N=100) were male respondents and 32.4% (N=48) were female respondents. This is to say those males are the highest number of respondents for this research. Figure 2 illustrate sex of the respondents using bar chart.

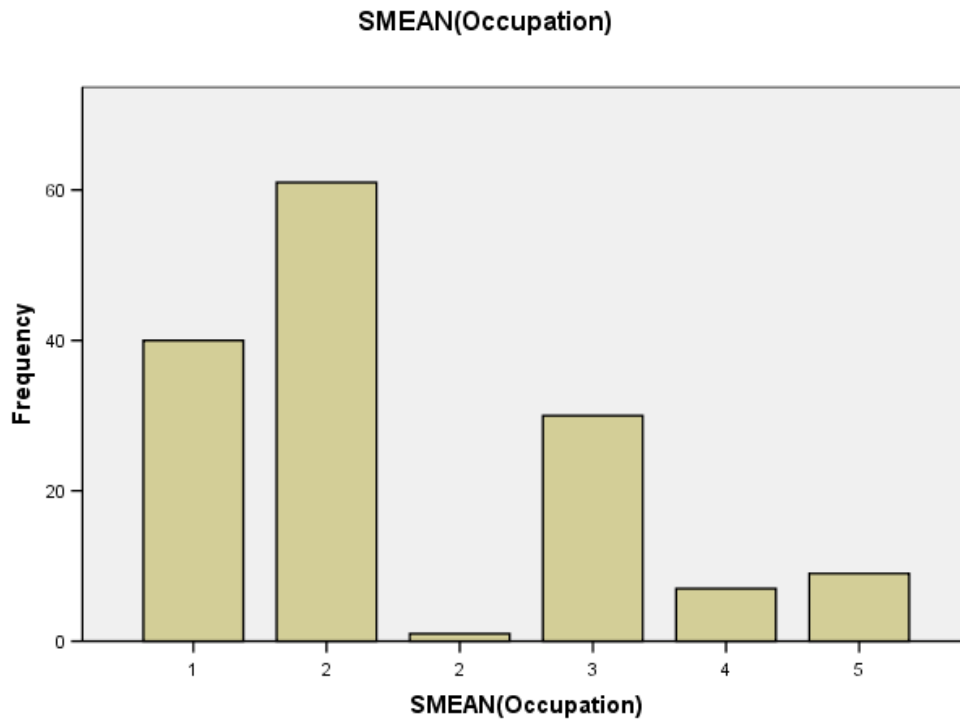


1.2.3 Occupation

Table 4.3 Descriptive statistics analysis of the Status (Occupation) of the respondents.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Public Servant	40	27.0	27.0	27.0
	Student	61	41.2	41.2	68.2
	Business Man	30	20.3	20.3	89.2
	Private sector/self employed	7	4.7	4.7	93.9
	Unemployed	9	6.1	6.1	100.0
	Total	148	100.0	100.0	

Highest number of the respondents were Students which has 41.2% (N=61), Public servants has 27.0% (N=40), then Business men 20.3% (N=30), Unemployed 6.1% (N=9) and the lowest number of respondents were Private sector/self-employed with 4.7% (N=7). However this can be illustrated in the figure below using bar chart below:

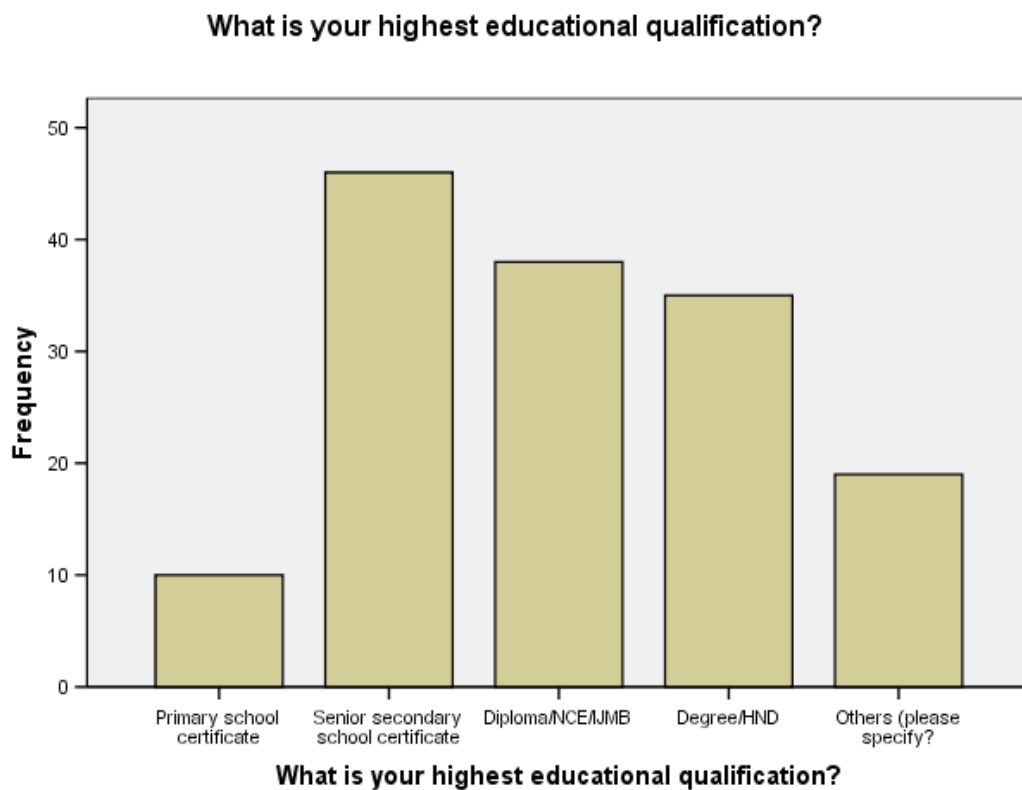


4.2.4 Educational Qualifications

Table 4.4 Descriptive statistics analysis of the Qualifications of the respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Primary school certificate	10	6.8	6.8	6.8
	Senior secondary school certificate	46	31.1	31.1	37.8
	Diploma/NCE/IJMB	38	25.7	25.7	63.5
	Degree/HND	35	23.6	23.6	87.2
	Others (please specify?)	19	12.8	12.8	100.0
	Total	148	100.0	100.0	

Most of the respondents were senior secondary school certificate holders with 31.1% (N=46), Diploma/NCE/IJMB categories 25.7% (N=38), Degree/HND 23.6% (N=35), others (M.Sc. or PhD) 12.8% (N=19) and the least were Primary school certificate holders 6.8% (N=10). Below figure illustrate qualifications of the respondents:



4.3 Frequency Analysis

In this section, frequency analysis is used to answer the two research questions for the analysis of internet access level and digital literacy level in terms of internet technology. The results from the questionnaires will then carefully be analysed and discuss very objectively. Frequency analysis is a descriptive statistics methods the show the number of occurrences of each response chosen by the respondents. When using frequency analysis, SPSS statistics can also

calculate the Mean, Median, Mode and standard deviation to help researcher analyse the result and draw conclusion (IBM SPSS Statistics 18, 2010).

4.3.1 Internet Access

Table 4.5 Descriptive statistics analysis of those that “have and do not”

Internet access

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	137	92.6	92.6	92.6
	NO	11	7.4	7.4	100.0
	Total	148	100.0	100.0	

From the table 4.5, majority of the respondents have access to the internet 92.6% (N=137), while only 7.4% (N=11) do not have access to the internet.

4.3.2 Internet Device Connections

Table 4.6 Descriptive Statistics of the device for the Internet connection.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Computer	54	36.5	36.5	36.5
	Mobile Phone	58	39.2	39.2	75.7
	Both	35	23.6	23.6	99.3
	Total	148	100.0	100.0	100.0

Highest number of the respondents were using the mobile phone 39.2% (N=58), 36.5% (N=54) of the respondents were using Computer, and 23.6% (N=35) of the respondents were both using mobile phone and computer.

4.3.3 Internet Access Method

Table 4.7 **Descriptive statistics of Internet accessibility method of the respondents**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Dial up	19	12.8	12.8
	Cable modem	23	15.5	28.4
	Wireless Network	51	34.5	62.8
	Cellular Broadband	55	37.2	100.0
	Total	148	100.0	100.0

From the above table 4.7 the respondents access the internet using Cellular Broadband with 37.2% (N=55), 34.5% (N=51) uses wireless network, 15.5% (N=23) uses Cable modem, and only 12.8% (N=19) uses Dial up access method.

4.3.4 Places Used to Access Internet

Table 4.8 Descriptive statistics analysis of the places most frequently use to access the internet.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Internet Cyber Cafe	42	28.4	28.4	28.4
	In my House	69	46.6	46.6	75.0
	At work (office)	24	16.2	16.2	91.2
	At friend's room	13	8.8	8.8	100.0
	Total	148	100.0	100.0	

Given that 148 of the total respondents, 46.6% (N=69) access the internet in their houses, 28.4% (N=42) access internet at the Internet Cyber Café, while 16.2% (N=24) access the internet at the work place (office), and only 8.8% (N=13) of the respondents accesses the internet at a friend's room.

4.4 Condition of Internet Access Level

Table 4.9 Indicating questionnaire analysis responses of section B2,

	<u>Very Poor</u>	<u>Poor</u>	<u>Satisfactory</u>	<u>Very Good</u>
	No. of Response	No. of Response	No. of Response	No. of Response
Q11.	25 16.9%	71 48.0%	52 35.1%	00 0.0%
Q12.	35	65	48 32.4%	00

	23.6%	43.9%		0.0%
Q13.	41 27.7%	74 50.0%	32 21.6	1 0.7%
Q14.	29 19.6%	73 49.3%	45 30.4%	1 0.7%
Q15.	18 12.2%	55 37.2%	71 48.0%	4 2.7%

From the table 4.9, **Q11.** How would you describe the current condition of IT infrastructure in your area? Most of the respondents response IT infrastructure is poor 48.0% (N=71), 35.1% (N=52) says satisfactory, 16.9% (N=25) says very poor and none of the respondents response Very Good. **Q12.** How would you describe the condition of internet connectivity in your area? Highest number of the respondents 43.9% (N=65) says that its poor, 32.4% (N=48) were satisfactory, 23.6% (N=35) very poor, and however, none of the respondents selected very Good. **Q13.** How would you describe the speed of the internet connection in your area? Exactly half of the total number of the respondents 50.0% (N=74) says the speed is poor, 27.7% (N=41) says the sped is very poor, 21.6% (N=32) says it's satisfactory, and only one respondent 0.7% (N=1) says it's very good. **Q14.** How would you describe the services provided by Internet Service providers? Most of the respondents 49.3% (N=73) says the services provided is poor, followed by 30.4% (N=45) says it's satisfactory, 19.6% (N=29) says it's very poor and only one respondent 0.7% (N=1) says it's very good. Furthermore, **Q15.** How would you describe the growth of internet access in your area? The responses of this question indicate that the highest respondents 48.0% (N=71) says the growth of the internet access were Satisfactory, 37.2% (N=55) says it's poor, 12.2% (N=18)

says it's very poor and only 2.7% (N=4) of the 148 respondents says the growth of the internet access is very good.

4.5 Internet Technology Literacy

This section determined the digital literacy level (in terms of internet technology) of the respondents and it will indicate how skilled they are at using various internet applications based from the questionnaire. Furthermore, analysis and discussion on this section will clear be explained by using tables and written explanations.

Table 4.10 Descriptive statistics of Internet Technology Literacy level of the respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Good	10	6.8	6.8	6.8
	Good	36	24.3	24.3	31.1
	Fair	43	29.1	29.1	60.1
	Poor	59	39.9	39.9	100.0
	Total	148	100.0	100.0	

From the above table 4.10, highest number of the respondents 39.9% (N=59) indicated that poor in terms of internet technology literacy, 29.1% (N=43) shows that the respondents were fair, 24.3% (N=36) were good and it's only 6.8%

(N=10) out of 148 respondents were Very good. This shows that most of the respondents do not have internet technology literacy.

4.5.1 Skills of Using Internet Applications

The respondents were asked to indicate how skilled they were using internet applications to measure their literacy level. The data reveals that the majority of the respondents were not internet applications literate and this correlates to the results of Q16 internet technology literacy level in which 39.9% of the respondents were not literate. Thus:

Table 4.11 Analysis of skilled of the respondents using internet applications

Applications	Never Used No. of Response	Not very skilled No. of Response	Average No. of Response	Very skilled No. of Response
Using internet to search for global information services on the web.	49 33.1%	36 24.3%	48 32.4%	14 9.5%
Using internet to access instant messaging service.	38 25.7%	37 25.0%	49 33.1%	23 15.5%
Using different internet browser, such as Mozilla, Opera, Explorer etc	9 6.1%	67 45.3%	43 29.1%	27 18.2%
Using different search engine to look up reference information for study purpose, Google, AltaVista etc	31 20.9%	44 29.7%	44 29.7%	28 18.9%
Using internet to send/receive e-mail messages, Yahoo, Gmail, Hotmail etc.	5 3.4%	18 12.2%	63 42.6%	60 40.5%

Using internet to search for global market products price.	94 6.5%	31 20.9%	18 12.2%	5 3.4%
Using web to buy or sell things, e.g. Computer, accessories, software, etc.	105 70.9%	31 20.9%	8 5.4%	4 2.7%
Using social network application to get in touch with friends and family, e.g. Facebook, Twitter, MySpace etc.	49 33.1%	39 29.9%	40 27.0%	20 13.5%
Using internet to make Skype Video call to friends and family.	62 41.9%	32 21.6%	30 20.3%	24 16.2%
Using internet to listen to sound recording via streaming audio.	71 48.0%	33 22.3%	25 16.9%	19 12.8%
Using Web to listen/read RSS feeds, e.g. BBC Hausa, CNN, Aljazeera etc.	53 35.8%	34 23.0%	41 27.7%	20 13.5%
Using internet to share photographs, video or other digital material, e.g. YouTube.	52 35.1%	45 30.4%	33 22.3%	18 12.2%
Using internet for Banking services.	111 75.0%	22 14.9%	11 7.4%	4 2.7%
Using internet to design and develop web page.	121 81.8%	12 8.1%	12 8.1%	3 2.0%

If we observe from the above table that measure the capability of the respondents using internet applications drastically very poor. This is because columns one and two (Never used and Not very skilled) emerged the largest number of the respondents, this is to show that majority of the respondents either they are not using most of the internet applications or they are not very skilful in using internet applications. However, majority of the respondents were only very skilful

using internet to send/receives' messages with 40.5% (N=60) out of the total number of 148 respondents. Furthermore, 42.6% (N=63) were average, 12.2% (N=18) not very skilled, while only 3.4% (N=5) never used internet to send/receives' messages. Moreover, this analysis proved our results of Q16 that majority of the respondents were illiterate in terms of internet technology applications with 39.9% (N=59).

4.6 Correlation Analysis

In this scenario, to fully explore the strength and direction of linear relationship between the two hypotheses, we used Pearson product-moment correlation. This Pearson correlation coefficient is one of the most suitable for the hypothesis testing relationship (Garcia, 2011). The Pearson correlation coefficient (r) can range from -1.0 to -0.5 indicating negative correlation and from 0.1 to +1 means positive relationship of the variables. However, A correlation of 0 indicate that there is no relationship between the variables. A high correlation whether negative or positive, it means there is strong between the variables, but when correlation coefficient is low, it indicates a weak relationship. Moreover, P-value results as $P < 0.05$ means it is significant. Garcia (2011) provides a classification of the strength of the relationship based on the size of the value of Pearson correlation coefficient (r) thus:

Table 4.12 **Guide to interpretation of Correlation coefficient Strength**

Scale	Strength
-1.0 to 0.5 or 1. To 0.5	Strong
-0.5 to -0.3 or 0.3 to 0.5	Moderate

-0.3 to -0.1 or 1.0 to 0.3	Weak
-0.1 to 0.1	None or very weak

Therefore based on the above guide to Correlation coefficient strength scale table, our four hypotheses (H_1 , H_2 , H_3 and H_4) were tested to determine the strength of the relationship of the variables. Below is Correlation analysis of the first hypotheses (H_1).

Table 4.13 **Correlation Analysis of H_1**

		Do you have access to the Internet?	What is your level of internet technology literacy?
Do you have access to the Internet?	Pearson Correlation	1	.102
	Sig. (2-tailed)		.218
	N	148	148
What is your level of internet technology literacy?	Pearson Correlation	.102	1
	Sig. (2-tailed)	.218	
	N	148	148

From the above table, the Correlation Coefficient of the first hypothesis H_1 is 0.102 and P value of 0.218, which is greater than 0.05. Therefore, this indicates that there is no significant relationship between Internet technology literacy and access to internet. Hence, H_1 is accepted.

Table 4.14 **Correlation Analysis of H_2**

		What is your age?	Do you have access to the Internet?
What is your age?	Pearson Correlation	1	.081
	Sig. (2-tailed)		.330
	N	147	147
Do you have access to the Internet?	Pearson Correlation	.081	1
	Sig. (2-tailed)	.330	
	N	147	148

Table 4.14 above shows that the Correlation Coefficient of H_2 is 0.081 and P value is 0.330 which is higher than 0.05. Indeed, this indicates that no significant relationship between internet access and age; hence, H_2 is also accepted, because correlation is not significant.

Table 4.15 Correlation Analysis of H_3

		What is your level of internet technology literacy?	How would you describe the current IT infrastructure in your area?
What is your	Pearson	1	-.411(**)

level of internet technology literacy?	Correlation		
	Sig. (2-tailed)		.000
	N	148	148
How would you describe the current IT infrastructure in your area?	Pearson Correlation	-.411(**)	1
	Sig. (2-tailed)	.000	
	N	148	148

From the above table (4.15), the correlation coefficient of H₃ is -0.411(**) and P value is 0.000. This shows that there is significant relationship at H₃, since P pointed to .000 (-.411(**)). Hence, H₃ is rejected, because correlation is significant.

Table 4.16 Correlation Analysis of H₄

		Do you have access to the Internet?	How would you describe the services provided by internet service providers (ISP) ?
Do you have access to the Internet?	Pearson Correlation	1	-.120

How would you describe the services provided by internet service providers (ISP) ?	Sig. (2-tailed)		.146
	N	148	148
	Pearson Correlation		1
		-.120	
	Sig. (2-tailed)	.146	
	N	148	148

The above table 4.15 shows that Correlation Coefficient of H₄ is -0.120 and P value is 0.146 which is greater than 0.005. Therefore, this indicates that there is no significant relationship between access to internet and services provided by Internet service providers. Hence H₄ is accepted.

Table 4.17: Summary of Hypotheses Tested

Hypotheses	Status
H ₁ . There is no significant relationship between Internet technology literacy and Access to Internet services.	Accepted
H ₂ . There is no significant relationship between Internet Access and Age.	Accepted
H ₃ . There is no significant relationship between Internet technology literacy and IT infrastructures.	Rejected
H ₄ . There is no significant relationship between Internet access and service's provided by Internet Service Providers (ISP)	Accepted

4.7 Discussion

The research finding obtained above is quite significant and interesting; internet access level and internet technology literacy level were fully studied in the rural community of Garun-Malam local government area. The Correlation Coefficient

of H₁, H₂, & H₄ were also found accepted while H₃ was rejected, so this shows that our hypotheses are well precise with great satisfactions.

Research Objective one. To determine the Internet Accessibility level of the respondents of the rural communities of *Garun-Malam* local government area of Kano State, Nigeria.

In our study, we discovered that majority of the respondents have access to the internet with greater percentage, 92.6% (N=137) out of 148 of the total number of the respondents. Furthermore, we also found out that many of the respondents were using mobile phone to access the internet, 39.2% (N=58) and they were mostly accessing the internet at their various houses, up to 46.6% (N=69).

According to our finding, we discovered that there were a lot of problems associated with internet access services which includes among the following:

- Poor IT infrastructures,
- Poor Internet connectivity,
- Speed of the internet connection is poor, and
- Poor services provided by Internet service providers (ISP).

The Internet is a system of interconnected public and private computer networks that utilize the TCP/IP protocol to provide service to billions of users across the world. Internet services are supplied through telecommunication networks. Due to poor IT infrastructures, poor internet services and facilities in most area of *Garun-Malam* local government, find it difficult to have good internet services,

despite the fact that Internet penetration is still growing with up to 48.0% (N=71). Major improvements are required if the Internet Society slogan "Internet for All" is to be realized. Internet offers endless opportunities for development. The rural community of Garun-Malam needs to exploit these opportunities in order to foster development and meet global challenges. Unless the above mentioned problems are solved for effective and sustainable development for the rural masses.

It is important to discuss how internet access will be improved to benefit the entire community of Garun-Malam local government. IT investors will be able to identify areas which provide great avenues for investment and which can lead to high return rate on investment. The investors are also in a position to note the infrastructural needs to execute their goals. Local government in collaboration with state government and Researchers needs to identify new areas that require investigation and research for providing good internet access and services. Of course, this research will also provide a basis for further research on the studied area.

Research Objective two: To examine the Internet technology application literacy level (Skill) of the rural communities of *Garun-Malam* local government area of Kano State, Nigeria.

Based on our finding, we discovered that majority of the respondents are not very skilful and does not have the necessary knowledge of using internet technology applications. The level of internet technology applications skills is too low and found that most of the respondents are only very skilful in sending/receiving e-mail messages with 40.5% (N=60) despite the higher rate of internet accessibility level of the respondents. This is a great and serious problem which needs to be

address by both ICT policy makers and the IT investors, because, Internet access/usage requires specific skills. Knowledge is therefore crucial in order for the rural communities to benefit from ICT. Warschauer (2002) suggests that conditions such as IT infrastructure/facilities, literacy, education, and institutional structures must be taken into account when assessing Internet success/usage.

In this study however, we discovered that our hypotheses H₁, H₂ and H₄ were accepted. The data reveal that there is no significant relationship between access to internet and internet technology literacy. There is also no significant relationship between internet access and age. There is no significant relationship between Internet access and service's provided by Internet Service Providers (ISP). But H₃ was rejected which shows that there is significant relationship between Internet technology literacy and IT infrastructures. Most of the respondents age that have access to the internet range between 30years to 40years, 33.8% (N=50), and 31.1% (N=46) of the respondents have only secondary school certification which is a low qualification. This actually contributed towards poor skills using internet technology applications.

Corlane and Evan (2008) said that there are some strategies in which access to internet and digital literacy can be improve includes; the price of the computer and internet facilities should be made available and affordable by bringing the cost down and increasing fiber-based international Internet connectivity to improve information and communication flows that can contribute to social and economic development. In addition, the government and IT investors needs to invest in education and IT infrastructures to improve literacy levels and promote knowledge acquisition. At the same time, provision of Community information

centre in all the rural areas will equally help to improve good internet access and internet applications skills.

As we have discovered that majority of the respondents do not have basic skills (knowledge) of internet technology applications or good understanding of how to use this technology, due to very many factors such as limited computer training schools, language and facilities. Internet application education is extremely important for this society, through education explicit knowledge is achievable. Knowledge helps analyse and critic the internet activity. The process of searching information through the internet needs understanding. Proper use of the Internet needs some basic knowledge, for instance being familiar with basic computer components of a computer, how to use internet, how to open, send and search relevant information are some of the basic ideas of internet skills and computer use. To improve knowledge in internet use both explicit knowledge and tacit knowledge play a significant role to improve the knowledge even if the way of getting knowledge is different for knowledge acquisition. Explicit computer training (internet application) generally improves basic understanding of the technology, however beyond that it is up to the individual effort to tacit knowledge through experience and individual effort.

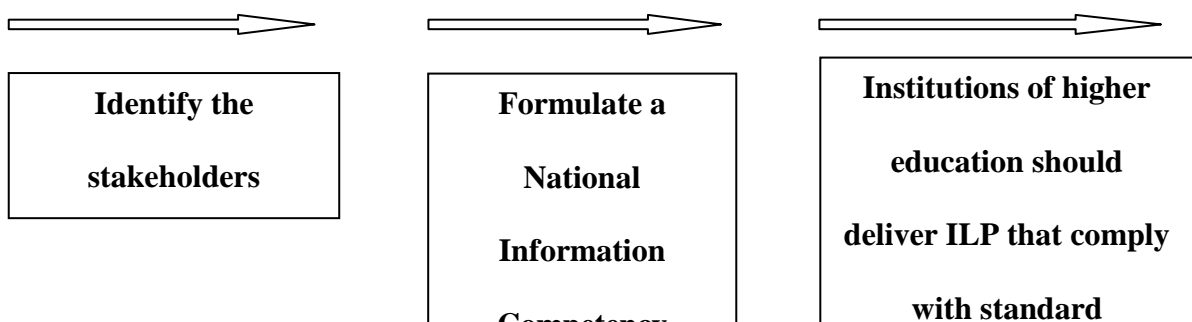
Self-motivated creativity is very much important for both IT professionals and IT users who want to move to higher knowledge levels in terms of understanding the specific phenomena. In general, knowledge acquisition is one of the problems facing internet application in the rural communities of Garun-Malam local government of Kano state, Nigeria. Therefore, in order to train these rural people on internet technology application to become more skilful, government (both state and local), IT investors, community leaders and of course individual efforts

should be taken in to account to improved and promote digital technology literacy.

4.7.1 Supporting Specific Framework

The main purpose of this research work is to understand the level of internet access and digital literacy in terms internal technology application of the rural community of Garun-Malam local government as well as providing sustainable solution towards bridging the gap. The result of this study shows that there is high level of access to internet among the rural community of Garun-Malam local government. Furthermore, the study reveals that the people of the target area were not skilful enough in using internet technology application. Therefore, on the basis of the above, we support Edzan and Zainab (2005) Framework for National Web-based Information Literacy. The adoption of this framework in the rural community of Garun-Malam local government will help to increase their level of skills towards internet technology application knowledge.

Even though, the framework was developed for the undergraduate of Malaysian students to provide them with information literacy competency skills. The students can learn how to access basic information needed effectively and efficiently without facing any difficulties, since it's a web-based application. However, when adopting this framework in the rural communities of Garun-Malam local government, the ICT policy makers in collaboration with IT professionals/investors can then narrow it to meet the level of the rural communities, since it has only been designed for the national level.



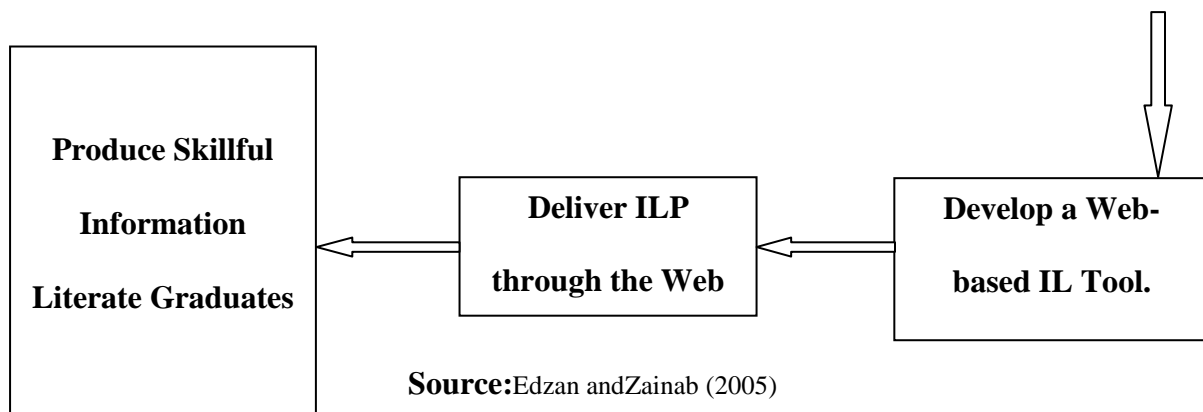


Figure 4.5 Framework for National Web-based Information Literacy

The above framework was developed in five steps, thus:

STEP 1: Identify the stakeholders involved, bringing them together and begin a dialogue on information literacy.

STEP2: Formulate a National Information Competency Standard.

STEP3: Institutions of higher education should deliver Information Literacy Programme that comply with the standard set up.

STEP4: Develop a Web-based Information Literacy Tool that is suitable for the system

STEP 5: Deliver Information Literacy Programme through the Web

In considering the above framework for web-based information literacy, step 2 and 3 can be narrow to fits the standard of lower level since the study is based on local government level and from the analysis of our questionnaire, results reveal that the highest educational qualification of the respondents of Garun-Malam

local government is secondary school with 31.1% (N=46), followed by Diploma/NCE/IJMB with 25.7% (N=38).

4.8 Summary of the Chapter

In this study, we analysed the data collected from the questionnaire using descriptive statistics analysis, frequency and correlation coefficient were used. Analysis of the results our research questions were elaborated comprehensively and precise using tables and written explanations. However, the hypotheses have been tested to determine the relationship between the variables. Hypotheses H₁, H₂ and H₄ were accepted while H₃ was rejected, since the results shows that there is significant relationship between the variables of hypothesis H₃. Furthermore, Edzan and Zainab (2005) Framework for web-based information literacy were specifically supported for adoption with little amendment so as to fit the local government level standard.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1 CONCLUSION

In summary, the analysis from this study, Internet access and digital literacy (applications skills) lead to the following conclusion.

The study has found that there is significant level of internet accessibility despite the fact that many people in these rural communities do access internet through their mobile devices and internet café respectively. There were a lot of problem regarding the IT infrastructure use, internet connectivity, speed of the connection and of course

poor services provided by internet service providers (ISP). These lead to the decrease of number of people that intend to connect to the internet services in the communities. Majority of the people prefer to access the internet using their mobile devices at any available area that internet services can be obtained, or go to any available internet café nearby.

The Internet is a system of interconnected public and private computer networks that utilize the TCP/IP protocol to provide service to billions of users across the world. Internet services are supplied through telecommunication networks. Due to poor telecommunication infrastructure and facilities in most of the urban areas not only in rural areas, internet access is still limited. Therefore, major improvements concerning internet access are required especially in the underdeveloped communities (emphasis must to be given to the rural areas), if really the internet Society slogan "Internet for All" is to be realized. Of course, internet provides life opportunities not only for individual or particular society but for national development. Therefore with this, rural communities of Garun-Malam local government absolutely needs to have these golden opportunities in order to compete with other developed communities for good development and transformation.

In the study, we found that there was no significant level of Internet technology literacy (skills) as majority of the respondents does not have basic knowledge of Internet application. In the empirical results, most questionnaire respondents indicated that they are only skilful in using internet to send/receive e-mail messages 40.5% (N=60) and using different search engine to look up reference information for study purpose with 18.9% (N=28) . This is because most of the respondents' access internet using their mobile phone and internet cafe, the most

probable reason would be that they used the internet to get in touch with their friends/relatives through email only.

Internet technology (applications) literacy is fundamental in any information society. Ability to have good skills on how to use Internet technology applications could lead to be well equipped with global information that will change the life of the rural masses to become much better and increase their economic, social and even political development.

It appears that the IT infrastructure and Services provided by the Internet Service Providers (ISP) are poor and this could lead to insufficient Internet services and decrease in Internet connectivity by the rural Communities. For effective Internet access/usage, provision of good and available IT infrastructures and sufficient Internet service become imperatives.

5.2 CONTRIBUTIONS OF THE STUDY

The results from this study indicated that there is high-level internet access among the rural communities of Garun-Malam local government despite the poor technological infrastructures surrounded the rural area of the case study. In addition, this study reveals that majority of the respondents do not have the basic skills of internet technology application as they mainly used internet to send/receive e-mail messages. Therefore, the findings have both theoretical and practical high level significance. In the practical aspect, the research finding provide the policy makers at both local and state, rural community leaders and of course IT-investors up to-date and useful information in formulations a sustainable strategies that can enhance or improve the Internet access/usage knowledge (skills) of Internet application in the rural

communities (Corlane and Evan, 2008). The rural communities of Garun-Malam local government will of course benefit from this study. For instance; provision of Information community Centres (CIC) well equipped with new technological infrastructures, Provision of training centres with expertise, creation of awareness, provision of ICT policy at local level and so on (Clement and Shade, 2000). Furthermore, the study reveals that there is significant relationship between Internet technology literacy and IT infrastructures. This shows that provision of up-to-date (good and national standard) IT Infrastructures is very essential to enable the rural communities to be skilful in accessing information through internet technology applications.

In the theoretical aspect, the research finding will of course contribute to the body of literature of digital divide (IS). Specifically, the study will contribute to the clear understanding of Internet access and its applications skills in the rural community. Meanwhile, the results should be thought of as another dimension of the benefits from closing the rural – urban education gap.

5.3 Recommendations

Based on the research finding, the following recommendations are imperatives, thus:

- Design, formulate and implement the of ICT policy at local government level.
- Provision of new technological IT infrastructures for effective and sufficient internet services.
- Establish essential Community Information Centres across the whole local government areas.

- Encourage the IT-investors professional to build the build more broadband internet infrastructures with sufficient services.
- Design a training programme activity for the rural communities to participate through the community leaders.
- Design Internet technology literacy skills course at secondary schools level and make it compulsory to all students.
- Provision of computer loan (without interest) or financial assistance to the rural masses.
- Creation of more awareness to improve the spirit among the rural communities people,

5.4 Future Research

This study is based on internet accessibility level and digital literacy in terms of internet application skills, therefore this research should be repeated in other local government community whether the same result would be experienced. Another research should be on conceptual framework for effective Internet technology literacy through broadband utilization in the rural community. Moreover research should also be carryout towards approaching communities without internet access on the grassroots. This would provide additional ideas for understanding and development of internet access/usage.

5.5 Limitation of the Study

Indeed, many researches must have their own shortcomings. Therefore, the period given to undertake this research is not sufficient enough as I have to go back to my

own country (Nigeria) to collect the data and analyse. This actually consumed a lot of time and financial implications. Furthermore, difficulties in meeting the target respondents as majority of the rural areas of the case study are farmers and business men, hence I have to gone round to various educational institutions, private and other governmental organisations in order to get target respondents.

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