

Research Article

The Effect of Digital Divide on Information Accessibility among Undergraduate Students of Ahmadu Bello University, Zaria

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Abstract: The study was undertaken to evaluate the effect of digital divide on information accessibility among undergraduate students of Ahmadu Bello University, Zaria. To accomplish this study, survey research was employed in gathering information from the sample population. Face to face method otherwise known as on the spot method of administration of questionnaire was adopted. The questionnaire was divided into two sections. Bio-data & the respondent's, at the course of this study, it was discovered that ICT are not readily available to most undergraduate students. The study also established that the gap between the haves and the have not to be bridge, the institution's management will need to ensure that the class rooms are internet connected and made available in every department to provide easy access to digital information especially to those who are financially incapacitated.

Keywords: Automation, census bureau, conceptualize, digital divide, disparity, policy, subscription-based

INTRODUCTION

Information technology became popular as a source of automation for information system in the 1970s, discussions and debates on the impact of this technology were centered on information gaps which existed between developed and developing countries. This lead to an assumption that the world populations may soon be divided into groups of inequality between 'information elites' and 'information ignorant'. However, as a result of rapid developments in Information and Communication Technology (ICT) this problem manifested in greater complexities associated with technological disparity. It came to light that technological disparity can occur within a single country, rather than between developed and developing countries. In addition, this disparity would not necessarily be confined to the computer or the Internet use but rather may involve accessibility in forms of ICT such as fixed line telephone, mobile phone. This awareness gave birth to another term, the 'digital divide', which encompasses a broader and more cavernous meaning than 'information gap'. 'Digital divide' began to gain popularity when it became a mainstream political topic in the US in the 1990s and eventually, it achieved recognition as an English colloquial term in dictionaries such as 'The Australian Concise Oxford Dictionary, 4th edition and the Penguin English Dictionary, 2nd edition. Although the term digital divide has taken on a broader and more cavernous meaning than 'information gap',

there have been times that the latter was used synonymously with the former Michelle (2009).

The concept of the digital is becoming more and more complex as access to computers and the use of computers, changes over time. When the existence of a *digital divide* first emerged, it revolved around access to computers and related technologies. The high cost of computers creates a large divide between people who could afford them and who had access to all the advantages of a computer and those who could not. As a result, the digital divide was further defined around social/political issue referring to the socio-economic gap between communities that have access to computers and the Internet and those who do not. The term also refers to gaps that exist between groups regarding their ability to use Information and Communication Technologies (ICTs) effectively, due to differing levels of information literacy and technical skills, as well as the gap between those groups that have access to quality, useful digital content and those that do not. The term became popular among concerned parties, such as scholars, policy makers, advocacy groups, in the late 1990s. Broadly speaking, the difference is not necessarily determined by the access to the Internet, but includes any ICTs and media channels that different segments of society can use Davison (2003).

According to Wikipedia Website (2007) the digital divide refers to the gap between people with effective access to digital and information technology and those with very limited or no access at all. It includes the

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imbalance both in physical access to technology and the resources and skills needed to effectively participate as a digital citizen. Knowledge divide reflects the access of various social groupings to information and knowledge, typically gender, income, race and by location. The term global digital divide refers to differences in access between countries. Thus, the study was aimed at evaluating the effect of digital divide on information accessibility among undergraduate students of Ahmadu Bello University, Zaria and Kaduna State.

Social dimension of the digital divide: The Digital Divide, or the digital split, is a social issue referring to the differing amount of information between those who have access to the Internet (especially broadband access) and those who do not have access. The term became popular among concerned parties, such as scholars, policy makers and advocacy groups, in the late 1990s. Broadly speaking, the difference is not necessarily determined by the access to the Internet, but by access to ICTs (Information and Communication Technologies) and to media that the different segments of society can use. With regards to the Internet, the access is only one aspect, other factors such as the quality of connection and related services should be considered. Today the most discussed issue is the availability of the access at an affordable cost.

The digital divide is not indeed a clear single gap which divides a society into two groups. Researchers report that disadvantage can take such forms as lower-performance computers, lower-quality or high price connections (i.e., narrowband or dialup connections), difficulty of obtaining technical assistance and lower access to subscription-based contents (Internet World Statistics, 2010).

The digital divide is probably one of the first concepts considered when reflecting on the theme of the social impact caused by Information and Communication Technologies (ICTs). From there on, one perceives that these technologies are going to produce differences in the development opportunities of peoples and that a distance will be established between those with access to these technologies and those without Kemly (2005).

There are several definitions of the term; Mehra (2002) defines it simply as the troubling gap between those who use computers and the Internet and those who do not. More recently, some have used the term to refer to gaps in broadband network access. The term can mean not only unequal access to computer hardware, but also inequalities between groups of people in the ability to use information technology fully.

Given the range of criteria used to access the various technological disparities between groups/nations and lack of data on some aspects of usage, the exact nature of the digital divide is both contextual and debatable. Servon (2002) argued that the digital divide

is a symptom of a larger and more complex problem—that of persistent poverty and inequality. Mehra (2002), identifies socio-economic status, income, educational level and race among other factors associated with technological attainment, or the potential of the Internet to improve everyday life for those on the margins of society and to achieve greater social equity and empowerment.

The conclusion from the various existing definitions of the digital divide is that the nature of the divide and the question whether it is closing or widening, depends on the particular definitions chosen. Based on the theory of the diffusion of innovations through social networks, a common framework can be set up to distinguish the main approaches researchers have taken to conceptualize the digital divide. All kinds of studies and approaches to the digital divide can be classified into these four categories.

- **Level of analysis:** Individuals versus organizations
- **Attributes of nodes and ties:** Income, education, geography, age, gender, or type of ownership, size, profitability, sector, etc
- **Digital sophistication:** Access versus usage
- **Type of technology:** Phone, Internet, computer, digital etc

The chosen definition of the divide has far-reaching consequences with immediate practical relevance and should therefore not be seen as a yet another intellectual quarrel of sole academic interest.

In recent years, as Information and Communication Technology has become the backbone of the global information economy, more attention has been focused on the increasing gap between developed and developing countries. This gap has come to be known as the 'digital divide'. But how big is it? With the advent of technology and technological devices, the medium of information storage, retrieval and dissemination has greatly lead to the use of computers and Internet facilities in accessing information other than the conventional method. Most users find it difficult to adjust to these new technologies while others do not have access to the devices at all. Therefore, the aim of these studies is to discover the split between undergraduate student of Ahmadu Bello University, Zaria who have access to digital information and those who do not.

Three types of digital divides are proposed:

- Access, based on the difference between individuals with access and those without access to ICTs
- Usage, based on individuals who know how to use these technologies and those who do not
- Usage quality based on the differences between those same users

Concept of digital divide: There are several definitions of the terms Digital Divide. Bharat Mehra (2002), defines it simply as the troubling gap between those who use computers and the Internet and those who do not. More recently, some have used the term to refer to gaps in broadband network access. The term can mean not only unequal access to computer hardware, but also inequalities between groups of people in the ability to use information technology fully Anthony (2004).

According to Kruger (2004) the 'digital divide' is a term that has been used to characterize a gap between 'information haves and have-nots' or in other words, between those Americans who use or have access to telecommunications technologies (e.g., telephones, computers, the Internet) and those who do not. One important subset of the digital divide debate concerns high-speed Internet access, also known as broadband. Broadband is provided by a series of technologies (e.g., cable, telephone wire, fiber, satellite and wireless) that give users the ability to send and receive data at volumes and speeds far greater than current 'dial-up' Internet access over traditional telephone lines Angele (2008). The digital divide refers to the gap between people with effective access to digital and information technology and those with very limited or no access at all. It includes the imbalance both in physical access to technology and resources and skills needed to effectively participate as a digital citizen, Rice (2002).

The idea of the digital divide resonates with "common sense" skepticism against claims of the revolutionary power of the Internet and the emerging utopian information society. Some suggest that the Internet and other ICTs are somehow transforming society, improving our mutual understanding, eliminating power differentials, realizing a democratic society and so on.

At the same time, some skeptics point out that not every gap is a problem. Michael Powell, chairman of the FCC, stated that the 'Mercedes divide' (differing ownership status of Mercedes-Benz automobiles) is not a problem, implying that the digital divide is not, either; but the access to the Internet is a universal service (e.g., to gain access to knowledge such as in encyclopedias) in some cases and Mercedes-Benz is not. Rebentisch (2008) criticized that most definitions of 'digital divide' fail the proffer criteria and reflect a negative view towards information technology. The definition of 'digital' was fuzzy in the context of 'digital divide'. Nielsen (2004) report shows strong growth of Internet access in underdeveloped countries. Apart from the ideas, the term can be traced back to early 1990s. The exact origin is unknown, but politicians such as Bill Clinton and Al Gore began using it in their speeches starting in 1995.

Unlike what the term evokes, digital divide is not indeed a clear single gap that divides a society into two

groups. Researchers report that disadvantage can take such forms as lower-performance computer, lower-quality or high price connection (i.e., narrowband or dialup connection), difficulty of obtaining technical assistance and fewer accesses to subscription-based contents. It should also be noted that cost of service may differ depending on location, being higher at the rural areas.

In the early days of digital divide analysis the availability of the access at an affordable cost was the key issue. As internet connection is becoming popular in some countries such as United States and broadband connection becomes realistic policy issues than future expectations, the increasing amount of discussion of the divide between people who have broadband connections and those who have narrowband. Many people can get cheap access in local Internet Cafes. Today the argument has moved on to skills and literacy, training people in computer skills, which often entail teaching them to read and write first.

Origin of digital divide: The term "digital divide" was coined in the mid-1990s by an anonymous source and was made popular in 1996 with the Telecommunication Act (Van Dike, 2006). Concerns about the digital divide from policy makers developed in the mid-1990s. According to DiMaggio (2001), Governments and researchers thought that the Internet and the World Wide Web would actually enhance equality of information access because they thought that the cost of information would now be reduced. However, they began to realize that the information divide was actually growing. DiMaggio (2001), stated in their study, "for the most part, group with higher levels of access to the Internet were the same groups (whites men, residents of urban areas) that had greater access to education, income and other resources that help people get ahead". After this recognition of inequality, an explosion of surveys and studies from both the public and private sectors sprung up in an effort to find the cause and solution to this growing problem. There began a recognition and understanding that the gap itself is self-perpetuating. This concept of self-perpetuation is important to keep in mind when addressing solutions to the digital divide.

Inequality of Information access has existed throughout time. This inequality of information access has been referred to by many names including the "knowledge gap", "anticipation in the information society", "the digital divide" and more recently, "computer literacy". Due to concerns with universal telephone service capability, the National Telecommunications and Information Administration (NTIA) was created in 1978 and "charged with conducting market research to shape public policy decision in achieving the goal of universal telephone service capacity," (Monrre, 2004).

In the 1990s, NTIA's mandate expanded to focus on universal Internet service capacity. The NTIA contracted with the Census Bureau to gather information on computer ownership and internet access and to investigate the impact of personal attributes such as income, race, age, educational attainment and three geographical variables: rural, urban and central city. NTIA produced a series of reports called "Falling through the Net" that helped solidify the public conception of dichotomous divides of technological access and consequently, technological solutions to close these dichotomous divide. In 1994, only 3% of Americans were using the World Wide Web (Pew, 2002). Researchers thought that the reason that more people were not using the Internet was simply an issue of affordability. Therefore, at the beginning of digital divide research, studies focused on providing the economically disadvantaged with physical access to the internet and related technologies (Van Dike, 2006). These dichotomous divide definitions have relatively recently been broadened to include the human resources divide which describes the lack of human assistance to support the technology and the Internet access issues and the social/community resources divide, which speaks to the need to involve local support to integrate technology and derive authentic benefits from this. However, Kemly (2005) historically review the concept, according to her, the relationship between technology and development has frequently been perceived as a lineal relationship. In fact, in the 60s and the 70s, at least in Latin America, there arose a large quantity of national programs supported by international and bilateral Organizations that targeted "technological transfer" from the developed countries to the poor countries.

However, at that time, it referred principally to technological transfer aimed at industrial productions, since it assumed that the availability of technology would produce development. When the peak of informatics development was reached in the rich countries around the year 1978, the impact of this technology on development was discussed. It was with this objective that UNESCO created an Inter-governmental Informatics organization (IBI) whose purpose is to create conditions so that poor countries achieve informatics growth and with this, the gap with the rich countries would be reduced. It is therefore expressed that informatics, are not necessarily the expansion of the Internet, that the discourse on the digital divide began to be built. "The adoption of informatics by the Third World countries and the application of a policy in this sphere allow them to access the same level of development as the industrialized countries.

The experience of the industrialized countries proves that informatics, born from progress, can in turn accelerate development. If the developing countries can

dominate it, they can in fact, thinks to improved resource management, contribute to reducing the gap that separates them from the powerful countries. This discourse is later generalized with the expansion of the Internet. In Okinawa (2000) the year, defines the development of a global information society as one of its main goals and creates the Dot Force with the objective of integrating international efforts and finding effective ways to reduce the digital divide. Although this document does not offer a precise definition of the digital divide, one can infer that it is understood as the inclusion or exclusion of the benefits of the information society. "We renew our commitment to the principle of inclusion: everyone everywhere should be enabled to participate in and no one should be excluded from the benefits of the global information society".

Another threat in the construction of the concept occurs at the World Summit on the Information Society (WSIS, 2003) in Geneva), whose call for papers is precisely the reduction of the digital divide. It is understood that this divide will be reduced with access to ICTs and with the creation of digital opportunities. In this summit, a strategy of digital solidarity between the rich and developing countries is proposed.

After the 2003 summit, a UN ICT Task Force is created, with substitutes the Dot Force to a certain degree and whose main objective is to list ICT usage with the achievement of the millennium objectives also defined by the United Nations. With this approach, there is intent to express how information and communication technologies can be used as a tool for development. Another important aspect to be recovered from this proposal is that today, there is not only discussion about the internet, but rather other information and communication technologies such as mobile phones.

The United Nations information and communication technology Task Force defines the digital divide in the following manner: "In recent years, information and communication technologies have become the backbone of the global information economy and given rise to the information society, more attention has been focused on the gap in access to ICTs between developed and developing countries. This gap has come to be known as the "digital divide".

Factors responsible for the digital divide:

Digital divide education: Another factor that affects the Digital Divide is literacy. Industrialized countries have a low rate of illiteracy; therefore, the gap between the users and non-users of the internet is lower than in developing countries. On the other hand, worldwide the illiteracy rate is higher. Some people do not know how to read or write and this most likely will limit their access to the digital technologies. Literacy is complex term that can simply be defined as reading and writing.

Literacy is connected to socio-cultural factors. Simply learning how to read and write does not mean that people will automatically be ready to access digital technologies (Warschauer, 2002).

In linking socio-economic status with the digital divide discussion, one must remember that education does not happen in a vacuum, but in a specific time/place continuum. Pippa (2001) states that “three quarters of all American college graduates use the internet compared with less than a fifth of those who failed to graduate from high school”. National statistics indicate that the more education a person has, the more likely they are to use the Internet.

Toward Digital inclusion (October, 2000) report indicates that “Better educated adults are more likely to use and become familiar with computers and the Internet at work or through their school experiences”. Mehra (2002) assert that 11.7% of households headed by someone with less than a high school education had Internet access in 2000 compared to 69.9% of households headed by someone with post graduate education. Sixty four percent of people with Bachelor’s degrees heading households had access, 49.0% of heads of households with some college and 29.9% of those with high school diploma in 2000. Therefore, the educational attainment divide is a self-perpetuating one in that the more education a person has, the more likely she will benefit from ICT which in turn increases benefits (from further education) from increased ICT.

Digital divide, national and global distinctions: The Digital Divide had different characteristics nationally and globally. Nationally, the divide in each country is different, because each country has a unique history, language and population characteristics. The population of the U.S is about 300 million. Approximately 205 million people or 68% are internet users (CIA World Fact Book, 2007). According to this data; nearly 95 million people in the US do not use or do not have access to the Internet. There are many factors that affect the access to the Internet, some of those factors include but are not limited to gender, socio-economic status, ability, age, education etc.

The total population of the world is nearly 7 billion (6.6 billion, according to CIA World Fact book, 2007), but the estimate of Internet users is only 1 billion, or 15%, worldwide (CIA World Fact Book, 2007). The US alone accounts for 20% of the users worldwide. Globally, the factors that affect the Digital Divide are similar to the US, with some exceptions. One example, according to Warschauer (2002), is race. Race should not be used in the US as a factor that increases the Digital Divide between Blacks and Whites, because the determining factor appears to be socio-economic status. This gap decreases as the income increases in Blacks. So the argument could be made that race is not an issue of the Digital Divide in the US. However, in a global context, race could be a factor, because

if we compare all the people in developed countries who have access to ICTs to all the people in developing countries who do not have, race is correlated. Caucasians benefit more from ICTs than others.

Digital divide and language issues: According to some figures 80% of the content in the Internet is in English retrieved July 30, 2007, from Wikipedia Web Site. This is an obvious barrier to non-English speaking and/or reading users to the Internet. Fortunately, many countries teach English as a second language and people do not need to be fluent in English to read the Internet. Reading is one of the first skills acquired when learning a language. Internet users who speak English as a first language comprise 35% of Internet users-close to 300 million people in the world (Wikipedia Website 2007).

There are more people who speak English as a second language, but they ‘create’ content in their first language and then translate this to English or vice versa. There are more than 7000. Warschauer (2002) languages in the world, yet the most popular language online are four or five (English, French, Spanish, German and Chinese). The Internet then could be perceived in some countries as a colonizer tool that the West is using to promote liberal ideologies that are not welcome in other countries. On the other hand, some people around the world see the Internet as a tool that can help improve the lives of people.

Digital divide and access to ICT: Access to technology is further divided within schools according to Socio-Economic Status (SES). The upper SES maintains access to technology at home. Whereas the lower SES children are limited to technology access only at school. With the non-equitable availability of technology outside of the classroom, there will continue to be dividing among student groups (Robyn, 2007).

Broadly speaking, the difference is not necessarily determined by the access to the Internet, but by access to ICT (Information and Communication Technology) and to media that the different segments of society can use. With regards to the Internet, the access is only one aspect, other factors such as the quality of connection and related service should be considered. Today the most discussed issue is the availability of the access at an affordable cost. The problem is often discussed in an international context, indicating certain countries such as the US are far more equipped than other developing countries to exploit the benefits from the rapidly expanding Internet.

The Digital Divide is not indeed a clear single gap which divides a society into two groups. Researchers report that disadvantage can take such forms as lower-performance computers, lower-equality or high price connections (i.e., narrowband or dialup connections), difficulty of obtaining technical assistance and lower access to subscription-based contents.

Access to information on the Web is restricted in specific ways even though there are high degrees of freedom relative to date, time and intensity. The hypertext principle and the linking of Web documents has a strong impact on the Web's infrastructure and therefore, on information access. "A link indicates the implicit presence of other documents and the ability to reach them instantly". But interconnectivity within the Web varies. According to a study based on 203 million Web pages at the IBM Almaden Research Centre, in fact 90 percent of all sites are linked to each other, but only 25 percent are referred to be "strongly connected components" with many in-links (links within a given site) and out-links (Broader *et al.*, 2000).

Bridging the divide: Robyn (2007) Argues that although education could be used as a tool to close the "digital gap" closing this gap will not completely close the achievement gap between students from lower and higher Socio-Economic Status (SES) backgrounds.

Many digital libraries provide free access to a variety of digital information resources. The Greenstone Digital Library (GDL); formerly New Zealand Digital Library, NZDL in New Zealand is a free digital library service that may be particularly valuable for users in the developing countries. Written (2002) list five specific areas where digital libraries can promote developments in the developing countries they include the dissemination of humanitarian information; facilitating disaster relief by providing the appropriate information; the preservation and propagation of indigenous culture; building collections of locally produced information; and creating new opportunities to enter the global market place.

Digital libraries can facilitate lifelong learning-the key success in this fast changing world. While discussing the collection and services of the Greenstone Digital Library, (Written, 2002) comment that digital libraries provide a golden opportunity to reverse the negative impact of ICT on developing countries. The main activities should include:

Building and linking local digital libraries which implies that building digital libraries of local and indigenous materials is an important step in bridging the digital divide. Many such digital libraries are now being built in the developing countries. Some Asian and African countries, for example Hong Kong, Singapore, Malaysia, India, South Africa, etc are ahead of others, but other countries are following the suit. A recent example is the development of the Genesha Digital Library (GDL) Network in Indonesia. Fahmi (2002); Digital outsourcing which concedes that information professionals in the developing countries should spend time on outsourcing of free digital information sources and services. The task of selection should include a number of activities including (a) identification of the appropriate sources and services based on the subject, sources/authority, user requirements etc evaluation of the sources in order to assess the suitability of the

selected sources and services in the light of the user requirements vis-à-vis the technical requirements to access and use them and to create some sort of surrogate for each source and service to facilitate organization; Organization of the digital information sources and services. This may requires basic web design skills, simple web skill may be acquired easily and a number of free courses and guides for web design are available on the web. In the absence of anything else, the editor that comes with the web browsers (Navigator, or Internet Explorer) may be used to design simple web pages. The major professional skills will be required in the organization of the identify digital resources and services. An understanding of the users and their information needs vis-à-vis the content, format, etc, of the selected sources and services may help the information professionals organize them properly. Appropriate tools used for information organization in traditional libraries (classification schemes, thesauri etc.) may be used for the purpose. In addition, using freely available digital library software and support: from a number of international digital library research groups, such as NDLTD, GDL may be used for building local digital libraries. Thus Information use rather than access is a major problem in many developing countries.

There are reasons for poor information usage despite having good access. One of the major reasons is poor information literacy. The other most important reason is the study culture and habits. In many countries, more so in the developing world, the study culture does not allow people to spend more time on the Internet and the day-to-day activities are based more on the traditional approach through the use of paper documents and telephone or written communications.

Poor information and digital literacy is a major problem in the developing countries. Widharto (2002) while discussing the problems facing information services in Indonesia comments that training remains a key to the future of the Indonesian libraries. This statement can be generalized for other developing countries too. Information or digital literacy training may be organized at different levels. Because of the limitation of resources, information professionals may began with a simple approach of providing training to the users at different levels-basic, advanced, etc nevertheless, to keep pace with the rapid changes in ICT and digital library systems and services, such training should be provided on a regular basis in order to help the users keep up to date and thereby make the optimum use of the sources and services made available to them.

Shimon (2001), argues that the Digital divide is not only a problem of the developing countries; within the developed countries there are significant proportion of the population for whom the digital divide is as prominent as it is between the north and the south. Nevertheless, as Ross Shimon, the Secretary General of IFLA, comments and has been justified, library and

Table 1: Access to digital information

Variables	Frequency	Percentage (%)
Very often	33	23
Often	76	53
Seldom	30	21
Never	05	3
Total	144	100

Table 2: Effect of digital information on academic performance

Variables	Frequency	Percentage (%)
Excellent	33	23
Very good	68	47
Good	40	28
Poor	3	2
Total	144	100

Table 3: Access to digital information for academic purpose

Variables	Frequency	Percentage (%)
Very often	33	23
Often	80	55
Seldom	27	19
Never	04	3
Total	144	100

Table 4: Information and communication technology devices used in accessing digital information

Variables	Frequency	Percentage (%)
Internet	93	65
Mobile phone	48	33
Others	3	2
Total	144	100

information professionals, even with their limited resources, can play a significant role to bridge the digital divide. While library and information professionals in a less fortunate situation can play a great role in making use of the recent digital library developments to the benefit of their users, there is some deeper issue too. The digital divide can only be reduced when the users actually make use of the information for the purpose of making informed decisions and in every aspect of their daily lives. Paul (2002) comments that the digital divide can be bridged by improved access, measured by access indicators, usage, measured by usage indicators and outcome, measured by impact indicators.

Table 1 shows that (33, 23%) have access to digital information very often while (76, 53%) often have access to digital information. (30, 21%) seldom have access to digital information, while (5, 3%) of the total respondents are of the opinion that they never have access to digital information. This shows that 76 out of 144 respondents which represent 53% of undergraduate students of Ahmadu Bello University have access often to digital information. From the investigation digital information has helped the students in their academic performance.

Based on the result presented in Table 2 the responses of the respondents, it clearly shows that digital information has helped students in their various academic performances. (33, 23%) are of the opinion that digital information has helped them excellently, while 68, 47% are of the opinion that digital information has been very good in helping them in their academic performance; (40, 28%) reveals that digital information has been good, while (3, 2%) digital

information has not helped them in their academic performance. With regards to the above analysis, it clearly shows that 68 respondents represented by 47% of the total sample size of 144 undergraduate students are of the opinion that digital information has been very good to their academic performance.

Table 3 Shows that (33, 23%) of the total respondents are of the opinion that the access digital information very often for academic purposes, while (80, 56%) access digital information for academic purpose often (27, 19%) seldom access digital information and (04, 3%) never access digital information. This implies that out of the 144 questionnaires administered and returned, 80 which is the highest, represented by 56% are of the opinion that students often access digital information for academic purpose.

Analysis of the Table 4 shows the various information and communication technology facilities used by undergraduate students of Ahmadu Bello University in accessing digital information (93, 65%) uses the internet in accessing digital information, while (48, 33%) make use of mobile phone as the device used for accessing digital information. Also (3, 2%) of the sample-size uses other ICT facilities in accessing digital information. This implies that 93 out of 144 questionnaires administered representing 65% undergraduate students make use of the internet as an ICT facility in accessing digital information.

From the result presented in Table 5, with regard to the question (38, 26%) are of the opinion that the devices are excellent, while (59, 41%) are of the opinion that the devices are very good in accessing digital information. Further (43, 30%) agreed that the devices are good for accessing digital information while (04, 3%) argued negatively that they are poor. The

Table 5: Effectiveness of the information and communication technology devices in accessing digital information

Variables	Frequency	Percentage (%)
Excellent	38	26
Very good	59	41
Good	43	30
Poor	04	3
Total	144	100

Table 6: Medium of digital information retrieval

Variables	Frequency	Percentage (%)
Computer	100	69
Mobile phone	41	29
PDA	2	1
Others	1	1
Total	144	100

Table 7: Possible problems encountered while accessing digital information using digital devices

Variables	Frequency	Percentage (%)
Network problem	101	70
Power failure	12	8
Low bandwidth	18	13
Cost	13	9
Total	144	100

Table 8: Cost of effectiveness to digital information

Variables	Frequency		Percentage		Total 100%
	Yes	No	%	%	
Cost of access to the use of information	89	55	62	38	100
Effect of education level to the use of information	85	59	59	41	100
Satisfaction of respondent to the quality of connection, processing speed of available ICT facilities in the department	31	113	22	78	100

analysis implies that majority of the respondents are of the opinion that these devices are very good and favorable in accessing digital information.

The Table 6, implies that (100, 69%) of the total sample size uses the computer as medium of information retrieval while (41, 29%) uses mobile phone as a medium of information retrieval. Furthermore, (2, 1%) of the sample size is the opinion that they use PDA in retrieving information while (1, 1%) makes use of other retrieval devices in acquiring digital information.

The Table 7, reveals that (101, 70%) of the sample size sees network failure as the main problem encounter while accessing digital information (12, 8%) says power failure is the main problem encountered, while (18, 13%) are of the opinion that slow bandwidth is the possible problem faced with when accessing digital information while (13, 9%) of the simple size express that cost of access is the possible problem militating against the usage of digital devices in accessing digital information.

The analysis in Table 8 implies that (89, 62%) of the respondents are of the opinion that cost of access is a major factor that affects the use of digital information (55, 38%) disagrees with this fact that cost is not a factor that affect usage of digital information.

In the Table 8, (85, 59%) undergraduate students agrees that one's level of education affects his/her use of digital information, while (59, 41%) students disagrees with the opinion. From the above, the level of orientation and one's level of education is tantamount to the degree of usage of digital information among undergraduate students.

The table clearly shows that (31, 22%) are satisfied with the level of connection and processing speed of the ICT facilities in their departments, while (113, 79%) of the sample size express non satisfaction with the level of connection and processing speed in their departments.

This implies that the digital devices in the various faculties and departments according to the student's the level of connection and processing speed is very poor, hence they expresses their dissatisfaction and discontentment with its speed of connection.

Description of area of study: The study centre round, the undergraduate students of Ahmadu Bello University, Zaria the effect of digital divide has on information accessibility among ABU undergraduate students. The researcher seeks the opinion of students through questionnaires to know the impact of digital

divide on their education pursuit. These no doubt was in line with Isichei (1993) and David-West *et al.* (1989) who were in support of adoption of new methods that is in line with accessing research and learning.

OBJECTIVE OF THE STUDY AND METHODOLOGY

The study among others seeks to find out students access to information and communication technology services and other level of utilization. The researchers also want to find out if financial status, users' education could act as restrictions of accessing the web and other web information. The study adopted case study to understand what prompted effect of digital divides on information accessibility among students of ABU, Zaria. This was also in line with Ndagi (1984) and Mohammed (2005) who supported through study of in-depth of the effect of digital divide among university students of ABU, Zaria.

RESULTS

This research study tried to look into the effects of digital divide on information accessibility among undergraduate students of Ahmadu Bello University, Zaria. This study consider the various types of ICT devices, digital information, medium of information access, digital divide in education and the issues associated with digital divide in the 21st century. The responses from the respondents have established that ICT devices are effective and efficient in the accessibility of information among undergraduate students. Summarily it was observed that digital information has a great impact on the academic performance of the undergraduate students of Ahmadu Bello University, Zaria and the cost of accessing the internet, the level of one's education and network problem affect the use of digital information among undergraduate students of Ahmadu Bello University, Zaria.

RECOMMENDATIONS

The following recommendations are hereby put forward to enable the institution manage the effects of digital divide in order to achieve efficient academic performance for undergraduate students:

- The management should embark on projects such as ICT installation in the various classrooms (multimedia lecture halls), so that students would

have free access to this wide range of opportunities provided by ICTs.

- Also, there should be a periodical evaluation of the existing ones on ground to ensure that they are always in good working conditions. This will enable the management to know what needs to be replaced, repaired and discarded since these technologies are in a dynamic changing nature.
- Furthermore, the management should try to incorporate the basic or fundamental knowledge of computer and other ICT devices into its academic curriculum for all students as a General course (GENS) in order to properly groomed its undergraduate students to its applications which will better their chances in both the knowledge of their usage and maintenance and also put them in an advantageous position above their colleague from other institutions.
- More so, there should be a periodic evaluation of the bandwidth of the existing networks available to compensate with the rising numbers of admitted undergraduate students in the university in order to ensure that this ICT resources are effectively and efficiently utilized, therefore increasing the level of their satisfaction.

CONCLUSION

In this study the researchers have been able to examine the effect of digital divide on the accessibility of information among undergraduate students of Ahmadu Bello University, Zaria ICT have a high positive advantage in terms of enhancing qualitative research study and effectively closing the gap of the haves and have not of digital information among undergraduate students of Ahmadu Bello University, Zaria. The fact that ICTs are not readily available to most undergraduate students due to reason such as the facilities not available and accessible in the various lecture rooms reduces the chances of accessing information. The undergraduate students most especially the financially handicapped ones (those without personal computers/laptop) have access to the wide range of opportunities to qualitative and quantitative information offered by these technologies, thereby putting them in a very terrible disadvantageous position and widening the digital divide gaps which need to be resolved.

Finally, it was established that for this gap between the have and have not to be effectively bridged, the institution's management should ensure that multimedia lecture rooms with internet connectivity be made available in every department to provide easy access to digital information especially to those who are financially incapacitated.

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