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Adoption and Use of Information and Communication Technologies by Educated Elderly People in Ibadan Metropolis, Nigeria

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Abstract **- Information and Communication Technologies (ICTs) offer opportunities and challenges in providing support and in enhancing the daily lives of older people. This study investigated the adoption and use of ICTs and the factors that influence the usage by the educated elderly in Ibadan metropolis, Nigeria. Convenience and snowball techniques were used to select the sample, while questionnaire was used to collect data from the respondents.**

The study found that the respondents were using mobile phones and computers, and that majority of them used both devices daily. The activities that the elderly used ICTs to perform are voice calling, phone messaging and e-mail. The study reveals that the children of the elderly, spouse and advertisement were the major factors that influenced the adoption and use of ICTs by the elders. The educated elderly people agreed that ICTs adoption and use has a lot of benefits. Cost of acquiring and maintaining ICTs was chosen as the major barrier they are facing in using ICTs.

The study recommends that it is favourable to design ICTs that meet the needs and wants of the elderly people in addition to ensuring the ICTs are easy to use by this group of people.

Keywords: **Information, Communication, Technology, Use, Educated, Elderly.**

I.INTRODUCTION

Information and Communication Technologies (ICTs) play an essential role in supporting daily life in today's digital society. ICT refers to the use of computer technology and its associated software, audio-visual and telecommunication equipment (including mobile phones) to send, receive, store and process information for desired objectives (Nwosu & Ogbomo, 2011). Apulu and Latham (2011) described ICT as any tool that facilitates communication, process and transmit information and share knowledge through electronic means.

The use of ICT has a link with social and economic development (Andrianaivo & Kpodar, 2011). Organisations, companies, private and government agencies are increasingly offering products, services, and information using ICTs. Educational institutions are integrating ICTs into their curriculum and are offering courses from a distance (distance learning or e-learning). Also, commercial activities are carried out through ICTs (e-shopping), while banking has been made easy through internet banking. Even medical services are now being offered online through the various health information systems (e.g. telemedicine). ICTs adoption and use has therefore become an integral part of the world, and because ICT has such powerful effects on human lives, it no longer makes sense to compare its risks and benefits. The question is no longer whether to use or not to use ICTs, but how to use it. Nigeria is also not left out in the ICTs revolution as she has also embraced the use of ICTs in all her sectors. Since the mid-1990s, ICTs has become prevalent in middle- and upper-class of Nigeria households while the lower class is struggling to catch the wave. The evolution of ICT has offered a world of opportunities to Nigerians. In spite of some challenges, a number of gains have been recorded with respect to ICTs usage in Nigeria.

As adoption and use of ICTs have become a significant phenomenon throughout many parts of the world, there has also been a significant increase in the number of elderly people as a proportion of the world's population (Sayago, Forbes & Blat, 2012; Ray, 2009). World Health Organisation [WHO] (2002) described population ageing as one of humanity's greatest triumphs as well as one of the world's greatest challenges and that global ageing is putting increased economic and social demands on all countries. The United States Census Bureau (2008) state that, the population is ageing, with a predicted 147% increase in the number of older adults (those over age 65) from the year 2000-2050. In other words, proportion of older adults in the population all over the world is also increasing.

Selwyn, Gorard, Furlong and Madden (2003) described ageing as highly significant in whether an individual can access and make use of ICTs such as the computer and the internet. It can be expected that the elderly population have less familiarity with ICTs as compared to the younger generation having being born at least 55-60 years ago when personal computers were not yet commonplace (Morris & Venkatesh, 2000). The young are considered the most active users of ICTs, and given that ICTs are commonly perceived as a technology for younger people, Näsi Räsänen and Sarpila (2012); Lawhon, Ennis and Lawhon (1996) said that elderly people experience difficulties using facilities, services and

opportunities made available through ICTs. Therefore, understanding and examining the role of ICTs in the everyday life becomes particularly important especially in the ageing society.

II.STATEMENT OF PROBLEM

WHO (2002) described the elderly people as precious, often ignored resource that makes an important contribution to the fabric of the societies. They are heterogeneous group with different needs and capabilities and learning abilities. Nevertheless, the vast majority of this aged population has not had the opportunity to learn and use ICTs during their younger years. Therefore, because of a growing ageing population and an increasing reliance on ICTs to conduct activities associated with daily living, research into ICTs usage by the elderly is seen as crucial in enabling them to remain relevant, active, independent and vitally engaged in the society (Goyal & Dixit, 2008). The use of ICTs started gaining prominence in Nigeria in late 1980s. This means that any Nigerian that is aged above 60 years of age could not have had the opportunity of learning and using ICTs in their younger years.

Investigation reveals that much of the existing literature on ICTs usage has focused on the younger age groups, who are commonly perceived as the more active users of ICTs. Chen and Chan (2011) highlight that most discussion of technology and technological devices and their use is directed to young adults; older people are neglected. In addition, most research covering the elderly ICT use has focused on examining older adults' ICT adoption, rather than understanding the rich context of use and meanings of use (Selwyn & Gorard, 2008).

Even though many works have been published on the use of ICTs by the elderly (Selwyn et al., 2003; Richardson, Zorn, & Weaver, 2002; Richardson, Weaver, & Zorn, 2005; Sayago et al., 2012; Gaßner & Conrad, 2010; Kim, 2008; Charness & Boot, 2009; Birkland, 2012; Slegers, van Boxtel, & Jolles, 2012; Liu, 2015), majority of the studies were carried out in the developed world. Little or none of these studies focus on the developing countries. It has not been established to what extent the findings for populations in developed worlds can be generalized to the older populations in developing countries because it has been demonstrated that people from different backgrounds are likely to have different attitudes towards acceptance of technology. In addition, people from different cultures have different perceptions and uses of technologies (Li & Kirkup, 2007). Thus examining the factors affecting older people ICTs adoption and use is timely and important. This study investigates the level of use of ICTs and the factors that influence its usage among the educated elderly in Ibadan metropolis, Nigeria. The paper also highlights the benefits associated with the use of ICTs by the elderly. Some barriers that the elderly could be facing were also identified. The paper recommends what government, relatives and caregivers should do to ensure that the elders do not lag behind in the ICT world and enjoy the benefits that ICTs have brought to the society.

In this paper, "the elderly" are defined as people over the age of 60 in accordance with United Nations standard (United Nations, 2001; WHO, 2002). This is because the use of ICTs became prominent in Nigeria in the late eighties. It can be expected that the elderly population from this age and above would have less familiarity with ICT, that is, majority of adults from this age upwards would not have used ICTs in their younger years. Age 60 is also the average of retirement in Nigeria. The term "ICTs" is used as the generic term to cover all types of technology such as computers and mobile phones.

III.LITERATURE REVIEW

United Nations (2008) predicted a growth in older persons of some 694 million or 223 per cent between 1970 and 2025. The database also predicted that by 2025, there would be about 1.2 billion people over the age of 60 and that by 2050 there will be 2 billion with 80 per cent of them living in developing countries. The United Nations (2011) also state that the older population has been growing at an unprecedented rate. The document states that, in 1980, there were 378 million people in the world aged 60 years or above. This figure has risen to 759 million over the past three decades, and is expected to rise to 2 billion by the year 2050. Therefore, it can be said that the average annual growth rate for the ageing population has increased considerably. The United Nations World Population Ageing (2009) pointed out that even though the older population is growing in all parts of the world, most of the increase is taking place in the developing regions.

Gerontologists have identified three stages of older adulthood. The years 65-75 are referred to as young-old, and most individuals in this age range remain in good health. The years 75-85 is consider the old-old years in which the effects of ageing are more frequently seen, and it can be hard for adults in this later group to completely care for themselves due to physical, mental, and health depreciation. 85 years and above are the years called oldest-old. In this stage, the full impact of ageing takes its toll on this population (Frolik, 1996). This situation highlighted raises questions of how best to tackle the problem of an ageing population. One of the solutions to the problem is adoption and use of ICTs (Selwyn, 2004a; Kim, 2008; Melander-Wikman, 2008; Gaßner & Conrad, 2010; Sayago et al., 2012; Nef, Ganea, Müri & Mosimann, 2013). This is mainly because ICTs offer opportunities in providing support and in enhancing the daily lives of older people. Selwyn (2004a) mentioned that the ability to use ICT is assumed a prerequisite to living in the information age. Therefore, ICTs is one of the tools that can ensure active ageing and socio economic participation for the elders.

However, while some are advantaged by the efficiencies, effectiveness, cost-benefits and conveniences that result from the use of ICTs, others are marginalized by these same innovations because ICTs access is not spreading to them as quickly. Nigeria has been described as one of the countries with low usage of ICTs, especially among the elderly (Opara and Ituen, 2011). Digital divide is the term used to describe this marginalisation. This can be explained as the discrepancy between people who have access to and the resources to use ICTs and people who do not have the resources and access to the technology. The digital divide that separates Nigeria's younger and older generations was reflected recently when a senior official of a Nigerian government organization could not dictate the website of the organization he represented when asked on a national TV programme. This reveals the level of understanding of ICTs among the older generation. The man may not be blamed because he did not grow up in the technology age. He could not have had the opportunity to use computer while in school. Therefore, what the average young person sees on a computer screen can only leave the elderly with no computer experience fumbling and scratching their heads in confusion.

Benefits of ICTs use to the Elderly

The exact benefits of the use of any ICT products vary considerably depending on the individual's ability and attitude towards human computer interaction. The ability to understand the application, to access it and trust in the technology is a key condition for its successful adoption and use. But for the elderly, just being given the opportunity to use ICTs can have a positive effect on their quality of life, their independence and on their family and social life, as well as their ability to participate in a work environment (Lenhart, 2009). The advantages of ICTs to the elderly are numerous - convenient tool (White & Weatherall, 2000; Richardson et.al. 2002; Gaßner & Conrad, 2010), communication/connectedness (Richardson et al., 2005; Ray, 2009; Karimi & Neustaedter, 2011); entertainment (Kim, 2008); enjoyable hobby (Eilers, 1989), shopping, searching for information, news, weather forecast; games (Kim 2008); mental stimulation (Czaja, Guerrier, Nair, & Landauer, 1993; Richardson et al., 2005; Eilers, 1989), among other numerous benefits.

ICTs can assist the elderly to carry out their daily work, keep intact their social network, monitor their health condition and improve their security. ICTs can enable the elderly to stay at home longer and in good health while increasing their quality of living by supplying ways of keeping in touch with their loved ones (Nistelrooij, 2010). ICTs offers the elderly the opportunity of ordering their food and medicines online and participate in systems for monitoring and diagnosis.

Other researchers have identified some benefits of ICT for the elderly that can be characterised as leading to either social and self-understanding benefits (e.g. increased access to current affairs and health information), interaction benefits (e.g. increased connectivity and social support), or task-orientated goals (e.g. ICT-assisted work, travel, shopping, and financial management) (Loges & Jung, 2001; White et al., 1999; Grazzi & Vergara, 2012). Empirical studies have also found the use of ICTs to lead older adults to lower perceived life stress (Wright, 2000; Selwyn et al., 2003; Selwyn, 2004a; Gaßner & Conrad, 2010; de Sain, 2011) and "higher quality of life" (Irizarry & Downing, 1997, p. 161; Melander-Wikman, 2008). But these benefits can only be realised when the elderly adopt and use ICTs.

Barriers to ICTs use by the Elderly

The main barrier to the use of ICTs by the elderly people, identified by literature, is not the fear of the technology, but the lack of perceived usefulness and motivation. The reason being that majority of the elders lived their childhood in a pre-digital world and have gained little or no experience of using ICTs. A lot of works (Richardson et al., 2002, 2007; Richardson, et al., 2005; Charness & Boot, 2009; Pedlow, Kasnitz, & Shuttleworth, 2010) has identified various barriers to ICTs use by the elderly. Richardson et al. (2002, 2007) identified seven major categories of barriers – emotions and attitude; declining faculties; financial costs; unfamiliarity with technology; age-unfriendly instruction; lack of relevance/motivation; and lack of social support. Richardson et al. (2005) classified the barriers into three categories – person-centred barriers (emotional mental and physical state), learning environment barriers (lack of emotional and physical support from others), and individual circumstance barriers (lack of perceived need for ICTs, lack of the ability to buy one).

The European Commission (2010, 2012) recognised the existence of several barriers and constraints for the use of ICTs for the elderly that can be summarized as poverty, illness, disability, availability, relevance and impact, cognition, and accessibility. The researchers carried out a pilot study in 2013 to identify the barriers to the use of ICTs by the elderly people in Ibadan metropolis. Some of the responses by the older people include, "I do not know what ICTs are", "I only know about cell phones", "ICTs are expensive", I don't have the means to acquire them", "My children cannot afford to buy them for me", "I do not need ICTs", "We don't usually have power supply in my area so using them may pose difficulties", among other responses. These barriers and feelings can restrict the possibility to the usage of ICTs by older persons.

Other barriers are lack of technological skills, low education levels, income, geographical location and health status/possible impairments. In addition, products and services are often not adapted to meet the specific needs of older users or are not adequately available, thus increasing their sense of frustration and dependency. If products in general are not adapted to older people, ICT products are even less adapted to them. For example, some ICTs such as

computers and mobile phones often have complicated navigation steps and the interface is not suitable for use by the elderly. Many older persons can also experience problems with the tools that accompany these ICTs, e.g. the buttons on some mobile phones and computers are too small, rubbery, do not click or provide feedback when the keys are pressed. Likewise, some menus are too many, most of them unnecessary, difficult to understand and recall. Some devices (e.g. cell phones) are too small to hold comfortably while text sizes are too small to read even with corrective lenses. Severe vision, hearing or dexterity problems also frustrate many older peoples' efforts to use ICTs.

The main objective of this study is therefore, to investigate the level of usage of ICTs by educated elderly in Ibadan metropolis, Nigeria. The study answered the following research questions:

1. What are the demographic characteristics of the elderly people who use ICTs in Ibadan metropolis?
2. What are the types of ICTs used by the educated elderly in Ibadan metropolis?
3. What activity do the educated elderly in Ibadan metropolis use ICTs to perform?
4. What factors influence the use of ICTs by the educated elders in Ibadan metropolis?
5. What are the benefits the educated elders in Ibadan metropolis derive from using ICTs?
6. What are the barriers to the adoption and use of ICTs by the educated elders in Ibadan metropolis?

IV.RESEARCH DESIGN, LOCATION AND POPULATION OF THE STUDY

Survey design was adopted for this study. The location of the study is Ibadan, Nigeria. The study was limited to Ibadan because of convenience and financial constraints. The population of the study comprised of all educated elderly people in Ibadan. The city is divided into eleven local government areas (LGAs). Five (5) LGAs were purposively selected from the eleven LGAs because they fall under the metropolis. Owing to the difficulty in obtaining a comprehensive and up-to-date population of educated elderly people in Ibadan, convenience sampling and snowball techniques were used. Forty (40) respondents were conveniently selected from each of the five LGAs. Therefore, the sample size for the study was 200 respondents.

A semi-structured questionnaire was designed to elicit necessary information from the respondents. In constructing the instrument, preference was given to previously tested questions and it followed generally accepted guidelines for building survey instruments. The questionnaire was divided into three sections. The first part was on the demographic characteristics of the respondents while the second section elicited information on types of ICT used, frequency of use and activities they use ICTs to perform. The third section gathered information on the factors that influence the use of ICTs by these elders.

A questionnaire was administered to one respondent each within the study area. This was repeated for all the participants, the total respondents consisted of 200 educated elderly people. All participants received a questionnaire written in English, which contained instructions and all variables under consideration. Based on the specification of study population, the respondents could understand the questionnaire and this allowed for effective administration of the instrument without the need for translators or intermediation. The researcher made use of places of religious worship (churches and mosques), pension offices, residential houses, supermarkets, banks and clubhouses to locate the respondents.

Adequate attention was given to the objectives of the study and extensive review of relevant literatures in designing the questionnaire. The validity of the questionnaire was ensured by giving the instruments to scholars who are experts in the area of study. Their input was used to refine and restructure the instrument and establish its content validity. The respondents' right for confidentially and privacy was taken into consideration in the process of designing and administering the questionnaire. Efforts were made to ensure that the respondents were not exposed to conditions that could bring harm to them. They were given the free will to choose whether to participate in the study or not. The study was therefore conducted by following strictly the ethical principles that govern the proper conduct of social research. Only descriptive statistic was employed to analyse the data using SPSS (Statistical Packages for the Social Science) software.

V.PRESENTATION OF RESULTS

The demographic characteristics of the respondents were analysed with percentage frequency counts. This is presented in table 1.

Table 1 presents the result of the demographic variable of the respondents. The males were 67.5% while the females were 32.5%. The result shows that 25.5% were within the age bracket of 60-65 years, 26.5% within the age bracket of 66-70 years, 26.5% within the age bracket of 71-75 years and 21.5% above 75 years of age. This shows that majority of the respondents were between 60-75 75 years. Furthermore, the table shows that 8.5% of the respondents had Secondary education, 38.0% had OND/NCE, 36.0% B.Sc./HND and 14.5% M.Sc./PhD. This shows that majority of the respondents had tertiary education. The marital status shows that 73.5% were married, 6.0% separated, and 6.0% were divorced. The results of the occupation of the respondents (presently or before retirement) shows 31.0% were civil servants, 14.0% were professional, 24.0% were into business and 31.0% were unemployed. The monthly income of the respondents (pension plus other sources of income) revealed that 49.0% earned less than ₦50,000,

39.0% earned between ₦50,000 – ₦100,000, and 12.0% earned above ₦100,000. 7.0% of the respondents described their health status as poor, 53.0% described it as good and 40.0% described it as very good. This indicate that majority of the respondents' health status was okay.

TABLE 1SOCIO-DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

	Characteristic	Category	Frequency	%
1	Sex	Male	135	67.5
		Female	65	32.5
2	Age	60-65 years	51	25.5
		66-70 years	53	26.5
		71-75 years	53	26.5
		Above 75 years	43	21.5
3	Educational qualification	Secondary education	17	8.5
		OND/NCE	76	38.0
		B.Sc./HND	72	36.0
		M.Sc./PhD	29	14.5
		Others (Standard six, Professional etc.)	6	3.0
4	Marital status	Married	147	73.5
		Separated	12	6.0
		Divorced	12	6.0
		Others	29	14.5
5	Religion	Christianity	136	68.0
		Islam	56	28.0
		Traditional	7	3.5
		Others	1	0.5
6	Occupation (presently or before retirement)	Civil servant	62	31.0
		Professional	28	14.0
		Business	48	24.0
		Unemployed	62	31.0
7	Present income (Pension plus other sources)	Less than ₦50,000	98	49.0
		₦50,000 - ₦100,000	78	39.0
		Above ₦100,000	24	12.0
8	How would you describe your health status	Poor	14	7.0
		Good	106	53.0
		Very good	80	40.0

Note: OND = Ordinary National Diploma; NCE = National Certificate of Education; HND = Higher National Diploma; B.Sc. = Bachelor of Science; MSc. = Master of Science; PhD = Doctor of Philosophy.

TABLE 2 ICTS USED BY THE EDUCATED ELDERS

	Types of ICT used	Frequency	%
1	Mobile phones only	67	33.5
2	Computers (e.g. laptop, desktop, galaxy tabs) only	42	21.0
3	Both (mobile phones and computers)	86	43.0
4	Others (Please, specify)	5	2.5

Table 2 shows that 33.5% used only mobile phones, 21.0% used only computers, 43.0% used both devices while 2.5% indicated they used other ICTs such as assistive devices, mobility, and iPods (2.5%).

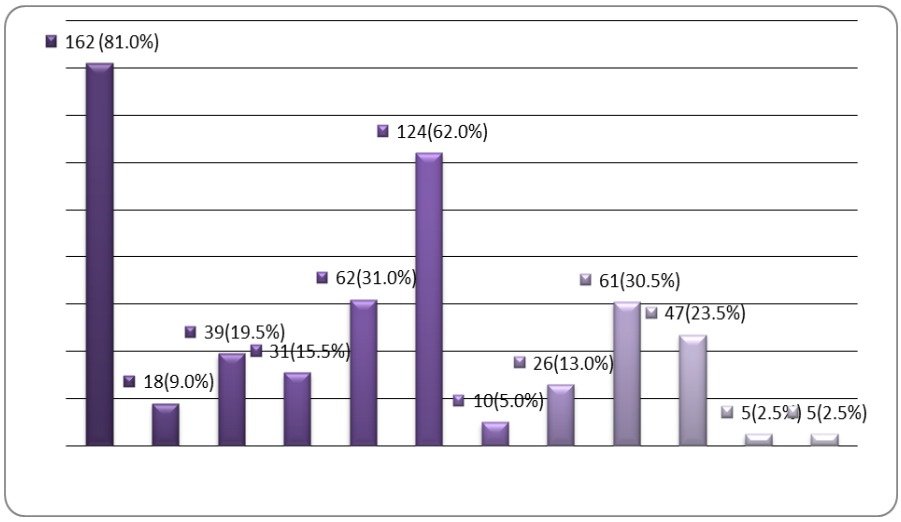

Fig. 3 Activities educated elderly used ICTs to perform.

The results show that voice calling was the major activities that the respondents used ICTs to perform as it raked topmost (81.0%). This was followed by phone messaging (62%). Watching of movies had the lowest response rate (2.5%) as well as other activities such as using ICTs to remind them of engagements and important assignments.

TABLE 3: FACTORS THAT INFLUENCE ADOPTION AND USE OF ICTS BY THE ELDERS.

	Factors	Agreed		Undecided		Disagree	
		Freq	%	Freq	%	Freq	%
1	My Children influenced my adoption and use of ICTs	125	62.5	0	0	75	37.5
2	My spouse/partner influenced my adoption and use of ICTs	132	66.0	6	3.0	62	31.0
3	My friends encouraged me to adopt and use of ICTs	77	38.5	0	0	123	61.5
4	Advertisement of ICT products influenced my adoption and use of ICTs	152	76.0	0	0	48	24.0
5	I made the decision to adopt and use ICTs because my job/work requires it	47	23.5	0	0	153	76.5

Table 3 reveals that majority of the educated elderly (62.5%) agreed that they were influenced to adopt and use ICTs by their children. Majority of the elderly (66.0%) also agreed that their spouse/partner influenced their adoption and use of ICTs. Likewise, majority of them (76.0%) agreed that advertisement of ICT products influenced their adoption and use of ICTs. However, majority (61.5%) disagreed that their friends encouraged them to adopt and use ICTs. In the same vein, majority (76.5%) disagreed that they decided to adopt and use ICTs because their jobs/work required it.

TABLE 4 FREQUENCY OF USE OF ICTS.

	Types of ICTs	Daily		Weekly		Fortnightly		Monthly	
		Freq.	%	Freq.	%	Freq.	%	Freq.	%
1	Mobile phones only	65	97.01	2	2.99	0	0.00	0	0.00
2	Computers /Internet	11	26.19	25	59.52	5	11.91	1	2.38
3	Both (mobile phones and computers/Internet)	64	74.42	10	11.63	10	11.63	2	2.32
4	Others (Assistive devices)	5	100.00	0	0.00	0	0.00	0	0.00

The results show that majority of the elderly who used mobile phones only used them on a daily basis (97.01%). Majority of them who used only computers/Internet used them every week (59.52%), while majority of them who used both mobile phones and computers/Internet used them daily (74.42%). Some respondents who indicated that they used other ICTs (e.g. assistive devices) mentioned that they used them on a daily basis.

TABLE 5 BENEFITS OF USING ICTS

	Benefits of using ICTs	Agreed		Undecided		Disagree	
		Freq	%	Freq	%	Freq	%
1	ICTs adoption and use enable me accomplish my activities more resourcefully, efficiently and effectively	189	94.5	0	0	11	5.5
2	ICTs adoption and use make me stay connected with my family, friends and loved ones regularly	164	82.0	0	0	36	18.0
3	ICTs adoption and use gives me independence	112	56.0	8	4.0	80	40.0
4	ICTs adoption and use contribute to the quality of my life	125	62.5	13	6.5	62	31.0
5	ICTs adoption and use enable me carry out my banking activities with convenience	102	51.0	0	0	98	49.0
6	ICTs adoption and use enable me do online shopping	56	28.0	0	0	144	72.0
7	ICTs adoption and use help me overcome boredom as I play games on my ICTs	62	31.0	0	0	138	69.0
8	ICTs adoption and use help me read news online	146	73.0	4	2.0	50	25.0
9	ICTs give me great control over my activities	165	82.5	9	4.5	26	13.0
10	ICTs provide helpful guidance in reminding me of tasks to perform (e.g. taking of my drugs, events to attend, birthdays of my family and friends)	168	84.0	0	0	32	16.0

The results in table 5 shows that majority of the educated elderly people agreed that ICTs adoption and use enable them accomplish their activities more resourcefully, efficiently and effectively (94.5%); ICTs adoption and use make them stay connected with my family, friends and loved ones regularly (82.0%); ICTs adoption and use give them independence (56.0%); ICTs adoption and use contribute to the quality of their life (62.5%); ICTs adoption and use enable them carry out banking activities with convenience (51.0%); ICTs adoption and use help them read news online (73.0%); ICTs give them greater control over their activities (82.5%); ICTs provide helpful guidance in reminding them of tasks to perform [e.g. taking of drugs, events to attend, birthdays of family and friends] (84.0%). On the other hand, majority of the elderly disagreed with statements - *ICTs adoption and use enable me do online shopping, ICTs adoption and use help me overcome boredom as I play games on my ICTs* (72.0% and 69.0% respectively).

TABLE 6 BARRIERS TO ICTS ADOPTION AND USE

	Barriers to ICTs adoption and use	Agreed		Undecided		Disagree	
		Freq	%	Freq	%	Freq	%
1	Cost of acquiring ICTs is high	200	100.0	0	0	0	0
2	Cost of maintaining ICTs is high (e.g. cost or call credit, internet access, etc.)	200	100.0	0	0	0	0
3	Learning how to use ICTs was difficult for me	185	92.5	0	0	15	7.5
4	Some buttons are too small to see	112	56.0	0	0	88	44.0
5	The arrangement of features and menu in some of the ICTs is clumsy	132	66.0	0	0	68	34.0
6	Interacting with ICTs requires a lot of mental efforts	126	63.0	0	0	74	37.0
7	I find it cumbersome to use ICTs	115	57.5	0	0	85	42.5
8	I often become confused when using ICTs	105	52.5	3	1.5	92	46.0
9	I often make mistakes when using ICTs	116	58.0	4	2.0	80	40.0
10	I find it difficult to operate some functions on the ICTs	122	61.0	3	1.5	75	37.5

The analysis of the responses of the educated elderly with respect to barriers they face in adopting and using ICTs is presented in table 6. All the respondents agreed that the cost of acquiring and maintaining ICTs is high (100.0%). Majority of the respondents agreed with the statements - learning how to use ICTs was difficult for me (92.5%); some buttons are too small to see (56.0%); the arrangement of features and menu in some of the ICTs is clumsy (66.0%); and interacting with ICTs requires a lot of mental efforts (63.0%). Majority of the elderly also agreed that they

find it cumbersome to use ICTs (57.5%); they often become confused when using ICTs (52.5%); they often make mistakes when using ICTs (58.0%); and they find it difficult to operate some functions on the ICTs (61.0%).

VI.DISCUSSION OF FINDINGS

The results reveal that both mobile phones and Computers/Internet were being used by the respondents, and that majority of them (about 74%) used both devices daily. This could be attributed to the relatively low price of mobile phones and computers due to advances and spread of mobile technologies. The findings could also be because of the growing trend of assessing the Internet through mobile phones. Internet services are becoming available on mobile phones making it possible to transact a wide range of services. Most mobile phone users can access the internet due to extended capacity and innovation by service providers and telecommunication industries. Mobile phones, computers and the Internet were mainly used by the elders to communicate with their children, spouse, relatives and friends. This result is in conformity with the study of Chen, Chan and Chan (2012) who found that basic technologies such as television and mobile phones had a high level of usage by older Hong Kong people. Review of empirical studies by Chen and Chan (2011) reveal that the technology that older people reported using was primarily mobile phones and the Internet.

The major activity that the elderly used ICTs to perform is voice calling, followed by phone messaging and e-mail. This is expected because mobile phones, computers and the Internet can be used to make voice calls, send text messages and e-mails. This finding is supported by Richardson et al. (2005) who found that the older New Zealanders used ICTs for connectedness (to get in touch with family members and friends).

The study reveals that the children of the elderly, spouse/partner, and advertisement were the major factors that influenced the adoption and use of ICTs by the elders. Children and close relatives tend to be more influential in the elderly decision to adopt and use ICTs because when people grow old, they usually have less contact with other people and so have reduced social networks. As Chen and Chan (2011); Charles and Piazza (2007) opined that older adults have more emotional investment in ties with family members and established friends but less interest in establishing new relationships. This is also categorised as subjective norms (SNs). The SNs of an individual captures the individual's perceptions of the extent to which his/her social environment (e.g. family, friends, co-workers, authority figure or media) influences his/her behaviour to make behaviour normal and desirable. SNs look at the influence of people in one's social environment on his behavioral intentions; the beliefs of people, weighted by the importance one attributes to each of their opinions, will influence one's behavioral intention.

Ajzen (1991); Venkatesh and Davis (2000), Lee (2003); Liu and Yang (2014) have been able to establish that there was significant relationship between SNs and intention to adopt and use and actual use of ICTs. Selwyn (2004a) found in his study that family and friends were very important in many of their interviewees' use of ICT as most of the interviewees were encouraged or coerced by their children to make use of computers. Selwyn (2004b, p.68) however found that, "even though children were cited as significant official factor in parents' and grandparents' adoption of computers, they were rarely the sole reason for adults investing time and money in ICTs. They are just one element in adult's actual use of ICTs". Therefore, children appear to play a peripheral role in supporting adults' use of ICTs.

The results in table 5 show some benefits that the educated elderly people agreed that ICTs adoption and use has given them. They agreed that ICTs adoption and use enable them accomplish their activities more resourcefully, efficiently and effectively; ICTs adoption and use make them stay connected with my family, friends and loved ones regularly; ICTs adoption and use give them independence; ICTs adoption and use contribute to the quality of their lives; ICTs adoption and use help them read online news; ICTs give them greater control over their activities; ICTs provide helpful guidance in reminding them of tasks to perform (e.g. taking of drugs, events to attend, birthdays of family and friends); and ICTs adoption and use enable them carry out their banking activities with convenience.

The exact benefits of the use of any ICT products vary considerably depending on the individual's ability and attitude towards human computer interaction. The ability to understand the application, to access it and trust in the technology is a key condition for its successful adoption and use. For the elderly, just being given the opportunity to use ICTs can have a positive effect on their quality of life, their independence and on their family and social life, as well as their ability to participate in a work environment (Lenhart, 2009). Literature has established numerous advantages that the elderly derive from using ICTs. ICTs are convenient tool (White & Weatherall, 2000; Richardson et.al. 2002; Gaßner & Conrad, 2010), communication tool (Richardson et al., 2005; Ray, 2009; Karimi & Neustaedter, 2011), entertainment (Kim, 2008), enjoyable hobby (Eilers, 1989), shopping tool (Kim, 2008), information retrieval tool [searching for information, news, weather forecast] (Kim, 2008). Czaja, et al., (1993); Richardson et al., (2005); Eilers (1989) have also established that ICTs use increase mental stimulation of the elderly. They are also use to play games (Kim 2008). Nistelrooij (2010) also explained that ICTs are useful to the elderly to carry out their daily work, keep intact their social network, monitor their health condition and improve their security. ICTs can enable the elderly to stay at home longer and in good health while increasing their quality of living by supplying ways of keeping in touch with their loved ones. ICTs offers the elderly the opportunity of ordering their food and medicines online and participate in systems for monitoring and diagnosis.

Some other empirical studies have also found that the use of ICTs lead older adults to lower perceived life stress (Wright, 2000; Selwyn et al., 2003; Selwyn, 2004a; Gaßner & Conrad, 2010; de Sain, 2011) and "higher quality of life" (Irizarry & Downing, 1997, p. 161; Melander-Wikman, 2008). The educated elderly have realized the benefits associated with the use of ICTs. This study has therefore established that the usefulness of ICTs is one key predicting factor that made the elderly adopt and use ICTs. This is in line with previous studies of Davis (1989, 1993); Keil, Beranek, & Konsynski (1995); Venkatesh, Morris, Davis, & Davis, (2003); Longe, Boateng, Longe & Olatubosun (2010); Phang et al. (2006); Su, Tsai and Hsu, (2013) who have identified usefulness as one of the critical factors that determine use of ICTs among the elderly people. In essence, the elderly people would use ICTs if they believed that the technology would improve their lives, satisfy their needs and help them accomplish tasks. ICTs that have been identified to be of immense benefits to the elderly are computers, phones, internet, and assistive devices (which are adaptive and rehabilitative technology for older people and people with disabilities such as an electronic alarm system, remote control systems and mobility devices (Miskelly, 2001).

The result in table 5 however reveals that majority of the elderly did not agree that ICTs adoption and use enable them shop online and overcome boredom. This shows that majority of the respondents had not embraced online shopping. They were also not using their ICTs to play games. Review of past empirical studies (e.g. Chen and Chan, 2011) pointed out that older people did not show interest in high-technology products, but rather value the technology that can make their lives easier and provide them safety and security. Therefore, encouraging Nigeria's elderly people to use ICTs that meets their needs is a key strategy for empowerment and improved quality of life. Many older people can benefit from using ICTs through increased mental stimulation, improved self-confidence, improved communication, particularly with younger generations; increased advertisement targeted at promoting the benefits of using ICTs, a greater sense of connectedness to the modern world, pursuit of an enjoyable hobby in retirement, and provision of a tool to pursue their interests as suggested by previous studies (Eilers, 1989; Czaja et al., 1993; Timmerman, 1998, Richardson, et al., 2002).

Surprisingly, the analysis of the responses of the educated elderly with respect to barriers they face in using ICTs reveals that all the respondents agreed that the cost of acquiring and maintaining ICTs is high. Majority of the respondents also agreed that learning how to use ICTs was difficult for them; buttons on some of the ICTs are too small to see; the arrangement of features and menu in some of the ICTs is clumsy; and interacting with ICTs requires a lot of mental efforts. Majority of the elderly also agreed that they find it cumbersome to use ICTs; they often become confused when using ICTs; they often make mistakes when using ICTs and they find it difficult to operate some functions on the ICTs.

These barriers can be summarised into seven main areas identified in the literature: (i) financial issues, including the high cost of computer acquisition and maintenance for people whose majority are on pensions; (ii) declining faculties associated with ageing, particularly short term memory loss and perceived complexity of ICTs; (iii) emotions and attitudes (an overarching belief (attitude) by the elders that they are too old to learn to use ICTs; (iv) lack of relevance/motivation, including a perceived lack of need for, or interest in, ICTs; (v) physical and cognitive problems in using ICTs (e.g. computer keyboard and mouse) due to arthritis and other health problems; (vi) lack of social support, due to the absence of friends and relatives encouraging them to use ICTs; and (vii) unfamiliarity with technology, limited access to ICT training for the elderly, and aged unfriendly instruction methods (particularly when being taught by young people who deliver material too quickly (Eilers, 1989; Roberts, 2001; Timmerman, 1998; Richardson et al., 2002).

Cost has been identified as one of the most critical factors determining older persons' acceptance of technology because majority of them live on pension and income from their children. This in part influences lower technology adoption. The cost of purchasing new ICTs and maintaining the services (e.g. cost of call credits, Internet access subscription, etc.) could be barriers to some older users. Chen, Chan, & Chan, (2012) found that cost and health problems were major barriers to the use of gerontechnology by the elderly. The cost of a product includes the first costs (i.e. purchase cost) and the long term cost such as maintenance and repair expenditure. This is vital because many of elderly people do not have strong financial support. Governments, non-governmental organisations, and ICTs developers could help by providing some preferential arrangements, such as subsidizing the cost of ICTs purchase and usage to the elderly, or establishing more facilities in local communities and public locations, in order to encourage older people to make greater use of ICTs.

Other barriers identified are attributable to old age. For example, inability to see buttons and the difficulty in learning how to use ICTs was as a result of declining faculties that characterises old age. Older people also have lower self-efficacy and higher technology anxiety.

VII. CONCLUSION

ICTs offer challenges and opportunities in providing support and in enhancing the daily lives of the elderly people. This study examined the usage of ICT by educated elderly in Ibadan metropolis, Oyo State, Nigeria. The study found that majority of the elderly people surveyed were using ICTs and that the mostly used ICT was mobile phones. The study was able to establish that SNs (children, spouses, partners and advertisement) of the elderly

influenced majority of them to use ICTs. The study has also been able to identify the benefits and barriers of ICTs use.

The study concludes that it would be favourable to design ICTs that meet the needs and wants of the elderly people, in addition to ensuring the ICTs are easy to use by this group of people. This is in line with previous studies who have indicated that older people are more likely to use technologies that are useful to them and are easy to understand and navigate through (McCloskey, 2006; Pan and Jordan-Marsh, 2010; Conci, Pianesi & Zancanaro, 2009; Su et al., 2013). According to Eggermont and Vandebosch (2009), ICTs technologies should carry content that is tailored to the elderly's interests and their needs, while new applications should be tested extensively in samples of the older population. ICT producers should also embark on adverts that promote the benefits and ease of use of ICT products among the elderly. Family and friends of the elderly can be employed to encourage them to use ICTs. Although the elderly are using ICTs, they have more difficulty than younger people do in learning to use and operate ICTs.

The study has some limitations in that the population was limited to a small population. Future studies should endeavor to focus on a larger population. The study also adopted convenience and snowball techniques; therefore, the results cannot be generalized to all educated elderly people in Ibadan metropolis, Nigeria. A great deal of benefit could also be derived from future studies that replicate or extend the findings of this study with other different methodology. The methodology used, being heavily quantitative and descriptive has its limitations. It provides a broad-based perspective of the questions under investigation, but may not be the best approach to obtaining a detailed understanding of these questions. Additional studies that use inferential statistics and qualitative approach may contribute to achieving a deeper understanding of the factors that influence ICTs use among the elderly. Further study may use random sampling with a larger sample size. These limitations notwithstanding, the findings of this research have contributed to literature in the area of technology and society.

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