

DETERMINANTS OF INFORMATION AND COMMUNICATION TECHNOLOGIES USE AMONG RURAL NIGERIAN WOMEN

Prof Nkiru Eze

Department of Mass Communication, NOVENA University Ogume, Delta State

Harvey G.O. Igben

PhD, Department of Mass Communication, Delta State University, Abraka, Nigeria

Harveygo.igben@aol.co.uk

Patrick Nkemdilim Ijeh

Ph.D, Associate Professor of Mass Communication, Department of Mass Communication

Delta State University, Abraka, Nigeria, ORCHID No 0000-0002-3876-7851

Ezeudu Benedicta Ogochukwu

Ph.D, BELLS University Of Technology Ota, Ogun State.

benebaka@gmail.com

Abstract

Recently, there has been an increasing dependence on Information and Communication Technologies (ICTs) in everyday life, both in professional and private lives. Researching the usage of ICTs by rural Nigerian women is of relevance, as unequal access and competencies related to ICTs remain a problem of social inclusion in a digitalized world. In the context of Diffusion of Innovation theory, a semi-structured interview was used to examine everyday usage and interpretation of ICTs by women in select rural communities in the South/south geopolitical zone in Nigeria. Most of the rural women did not own but had access to ICTs through cellular phones. The approaches for ICTs' adoption were family-centred and technically support approaches; while getting in touch, bandwagon and business transactions were their reasons for using ICTs.

Keywords: ICTs, Rural, Women, Determinant, Bandwagon

Introduction and Justification for the Study

Information and Communication Technologies (ICTs) are critical forces driving social and economic development. Embracing the broad conceptualization of ICTs, this study draws a definition of ICTs established by the United Nations Development Programme. According to (UNDP, 2001), ICTs can be defined as a varied set of goods, applications and services that are used to produce, store, process, distribute and exchange information. They comprise diverse telecommunication, television and radio broadcasting equipment, computer hardware and software, computer services and electronic media. They function as 'technologies of relationship'; objects of emotions, feelings and experiences that relate to how the media can be integrated and used in shaping social life (Ijeh, Umukoro & Amune 2015; Givskov, 2017). They

have the potential to improve the delivery of services, increase productivity, raise living standards, transform economies and develop opportunities; offering opportunities to those who can use the new technologies, but also present new challenges for those who are left behind (Treinen & Elstraeten, 2018).

Adoption and effective usage of ICTs by the entire populace of every country on the globe is a strategy to address the development challenges of marginalisation and exclusion from the competitive global market system driven by globalization and powered by ICTs. However, there is a huge development gap between Africans and the developed world which research has attributed to the digital divide (Oghogho & Ijeh 2017). There is also a development gap between the urban and rural communities where unequal access to ICTs is more evident. The implication is that people who have access to ICT will benefit from it, and those who don't will not. Benefits include boundless information sharing, connectivity, and participation in the global economy. Despite the high hope for using ICTs to revive rural communities, there is no empirical evidence of how the rural population uses the ICTs in order to step up to the global market. Researching the usage of ICTs by rural Nigerian women is of relevance, as unequal access and competencies related to ICTs remain a problem of social inclusion in a digitalized world.

In addition to a considerable digital divide between urban and rural dwellers (Treinen & Elstraeten, 2018), gender also plays an important role in the context (Jain, Ahuja, & Kumar, 2012; Ratzenback, 2016; Treinen & Elstraeten, 2018)). Research has it that more than 70 per cent of the Nigerian population lives in rural areas (MacClintock (2012), among them are mainly women (MuGeDe, 2013). Again, research (Eneh, 2010; Treinen & Elstraeten, 2018) has proved that women are low users of ICTs (Ezeh, Chukwuma & Okanume, 2017). This study aims to provide deeper insight into the determinants of ICT use among rural women, a group triple affected by the divides in Nigeria. Although the digital divide between gender and urban and rural dwellers has been demonstrated repeatedly, there is still a need for theoretical tools supporting the individual aspect of ICT use and the experiences of rural women in empirical material. This study fills this gap by investigating the everyday usage and interpretation of ICTs, (mobile phones, computers, and the Internet) by rural women; to understand what informs their ICT use and mode of engagement.

Significance of Rural Women to the Study

This study is significant in demonstrating the relationship between ICT use and rural women's engagements in the digital and information age. In most countries of the world, including Nigeria, women face a triple divide - rural divide, digital divide, and gender divide (Treinen & Elstraeten, 2018). The rural divide refers to the gap between urban and rural areas in access to ICTs. The digital divide refers to the gap between demographics and regions that have access to modern ICTs, and those that do not have access, or have restricted access. The gender divide refers to the differences between women and men in access to ICTs, resulting in rural women being relegated to the most disadvantaged position.

The term 'rural' means a community that generally has a significant portion of its response area undeveloped. Rural communities in developing countries are more disadvantaged (Oghogho & Ijeh 2017). Ruralites are persons who live within rural communities in countries like Nigeria. The poor communication infrastructure for receiving valuable information in their areas is worrisome (Owuamalam, Ezeh & Eze, 2020). Some of them still lack infrastructure, like

electricity, good road network, good water supply and the most remote areas are still beyond the reach of a mobile signal (Treinen & Elstraeten, 2018). This is where abundant human and natural resources lie and a place where its population mainly engages in agriculture as well as the basic rudiment of tertiary activities (Ele, 2006). Agriculture is considered the primary economic sector from which basic human needs- food, clothing and shelter are extracted (Motes, 2010), and the foremost industry that positively drives the economy (Ele, 2006). ICT adoption and integration is sine qua non for meaningful development strides in the rural areas for it will go a long way in unlocking its potentials, especially in areas of agriculture and food security. Unfortunately, Low incomes and high levels of illiteracy among the rural dwellers are barriers to the possible adoption of ICTs. This further widens the gap and leaves the area in a developmental despondency (Ijeh, Umukoro & Amune 2015).

Many of the factors that constrain rural men from adopting more sustainable and productive practices restrict women to an even greater extent. The patriarchal social structure in Africa provides a framework upon which marginalization and discrimination are based (Ezeh & Enwereuzo, 2015). Specific gender barriers further limit women's capacity to innovate and become more productive. Gender according to (Jain, Ahuja, & Kumar, 2012) is the relations between men and women, both perceptual and material. Gender is not determined biologically, because of the sexual characteristics of either women or men but is constructed socially. It is a central organizing principle of societies and often governs the processes of production and reproduction, consumption, and distribution. Women represent more than half this population; and it is documented that they perform the lowest-paid activities and are concentrated in the low-end jobs and occupations (Ikumola and Okunola, 2011). MacClintock (2012), writes that women do two-thirds of the world's work, earn 10% of the world's income and own <1% of the world's property. They comprise 43% of the world's agricultural labour force, which rises to 70% in some countries. In Africa, 80% of the agricultural production comes from small farmers, who are mostly rural women (MuGeDe, 2013). They are also custodians of a wide repertoire of indigenous knowledge on the medicinal use of plants and have been at the forefront of soil conservation, and household and livestock management (Commonwealth, 2005; Omeire, 2018), yet they do not have access and control over all land and productive resources (MuGeDe, 2013).

Men and women do not have the same access to, use of and control over ICTs. Rural women often tend to have less access to ICTs, leaving them and their families at a disadvantage (FOA, 2018). Also, illiterate, and older rural women often have less developed digital skills and are therefore generally less likely to adopt ICTs (FOA, 2018; Ufuophu-Biri & Ijeh 2021). They are disadvantaged concerning access to relevant and affordable agricultural technologies, such as improved seed, fertilizer, insecticide labour and time-saving machines needed to boost productivity (Omeire, 2018).

Rural women's access to a broad range of technologies could help free them from the triple divide that (Treinen & Elstraeten, 2018) talked about. ICT intervention provides huge potential that could help close the gaps and empower rural women to make choices that are better for them and their families. Hence, this study tries to look at the extent of adoption of ICTs among rural women and their mode of engagement, to find the solution to their perpetual relegation to the background in the digital and information age.

Research Questions

The study addresses the following questions:

1. What is the level of availability of Information and Communication Technologies to rural women in the South-South geopolitical zone in Nigeria?
2. What is the extent of Information and Communication Technologies use among rural women in the South-South geopolitical zone in Nigeria?
3. What determines the use of Information and Communication Technologies among the rural women in the South-South geopolitical zone of Nigeria?

Literature Review

ICT Penetration in Nigeria

According to ITU statistics, personal computer (PC) penetration in Nigeria is still very low in a ratio of 7 computers per 1000 Nigerians (ITU, 2017). The high cost of computer equipment and the grossly underdeveloped technological base are the major reasons for the low penetration rate. Taske & Plude (2011), report that about 68% of mobile subscriptions are in developing countries as Nigeria, calling mobile phones, the computer of choice of the global poor and “m-powerment tool”.

Mobile media is perceived as a personal device and rarely shared with a second person (Feldmann, 2006), always on the owner, and has become convergent. The mobile phone has made history as one of the fastest-diffusing communication technologies, (Wei, 2013) and the world’s largest distribution platform (Khalil, Dongier and Qiang, 2009) and a window into the increasingly fast-paced world (Punch, 2017). Most mobile phones used today are internet-enabled migrating from just making calls and sending short messages, to indispensable gadgets that play multi-faceted roles including computing, banking, online shopping, virtual assistant, fitness coach, personal physician, news source, compass, etc. It also enables the users to call, chat, ping, Facebook, tweet, whatsapp, surf, search and browse thereby increasing their online presence (Ijeh, Umukoro & Amune 2015; Ufuophu-Biri & Ijeh 2021).

A study also has it that Africa has 960 million mobile subscribers and 216 million Internet users at penetration rates of 80% and 18%, respectively, while in Nigeria, mobile subscribers have reached 150 million, and the number of its Internet users has climbed to 97.2 million at penetration rates of 81% and 53%, respectively. Although Nigeria, Egypt and Kenya are among the biggest mobile phone and Internet users in Africa, Nigeria has 62.2 million and 52.1 million more internet and mobile users than Egypt, respectively. It also outpaces Kenya by 65.3 million and 110.78 million internet and mobile users, respectively (Gandahi, 2016; Smith & Tran 2017).

In Africa, the proportion of women using the Internet is 25% lower than the proportion of men using the Internet. In least-developed countries, only one out of seven women use the Internet compared with one out of five men (Treinen & Elstraeten, 2018). However, the gap is more visible among senior citizens (Ezeh & Mboso, 2019) as they do not play active roles in digital activities.

Theoretical Framework

Diffusion of Innovation Theory

Diffusion of Innovation Theory developed by Rogers in 1962, originated in communication to explain how, over time, an idea gains momentum and diffuses (or spreads) through a specific

population or social system. According to Rogers, an innovation is an idea, practice, or object that is perceived as new by an individual or another unit of adoption. Diffusion is a special type of communication concerned with the spread of messages that are perceived as new ideas. Diffusion of Innovation, therefore, is the process by which an innovation is communicated through certain channels over time among the members of a social system (Rogers, 2003). The members or units of a social system may be individuals, informal groups, organizations, and/or subsystems.

Rogers explained that when a new idea is introduced, an initial few people are open to the new idea and adopt its use. As these early adopters communicate the idea through various channels, more and more people become open to it. Over time, the idea becomes diffused amongst the population until a saturation point is achieved.

However, factors that determine the rate of adoption of innovation in a social system include; the availability of information concerning the innovation (like relative advantage, compatibility), observability to people within the social system, etc.), adopters' properties (like past experience), characteristics of the social system (like social norms, availability of social agents like gatekeepers and opinion leaders), and the communication process (through which media, like mass media or interpersonal communication) (Lyytinen and Damsgaard (2001).

People, who key into the adoption of Information and Communication Technologies like computers, the Internet, and mobile phones, have relative advantages over those who do not. They could help free women's time for more productive activities, enhancing their agricultural productivity, improving the market returns they receive (Treinen & Elstraeten, 2018), increase their visibility in national and international markets, (Nkamnebe, 2010), connect to other farmers and policymakers, and empowering them to make choices that are better for themselves and their families.

Method

The study adopted an In-depth interview research method. The research theme focused on ICTs availability to the participant and their use of ICTs such as computers, Internet and mobile phones, strategies of usage of specific ICTs (computers, cell phones and Internet) and determinants of uses. Semi-structured interview constitutes the most extensive body of material. The purposive sampling technique was used in the selection of rural communities in the South/south geo-political zone of Nigeria where the interview took place. Two communities were purposively selected from three randomly selected states, out of the six states in the South/south geo-political in Nigeria. The rationale for the use of semi-structured interviews was to concentrate the investigation on selected rural women in each selected rural community, to have an interaction with the respondents. Four interview sessions were conducted in each of the selected communities (Onicha- Ukwuani in Ndokwa West L. G. A. of Delta state; Ibot, in Mkpato Enin L. G. A. of Akwa Ibom state; and Ozuzu in Etche L.G.A of Rivers State). This means that a total of 12 interview sessions were used in the study.

Selection criteria for participants for the study are gender (female) and place of residence (rural communities in a South-South geographical region). Included are also women from diverse living arrangements (single, widowed, with a partner, or extended family) as well as different professional experiences. The result was thematically analyzed based on ICT availability to the participants and their usage strategies.

Techno-Availability and Use

From the interview conducted, one was able to understand the ICTs availability and use among the participants in three categories: Current Users, Ex-Users and Never Users.

Current Users of ICTs

The use of cellular phones among the participants is on the increase when compared to computers. Some claimed to own a mobile phone when they only had access to it or shared it with the entire household. A participant who claimed to own a mobile media answered this when asked where her mobile phone was;

.....my husband went out with the phone....., he picks most of the time calls come in In case of callers who would want to speak to me directly, he tells them when to call back...

All interviewees who were current users and ex-users of computers had also used mobile phones in one form or the other. The use of Smartphones that are Internet-enabled was still very low among the respondents. This relates not only to the purchasing power of the participants but also to the level of competence required in its use.

Work-related experience is a factor that determines the participants' use of computers. Participants who were current users of computers were either students or people whose professions demanded the knowledge of computer participants. A 26-year-old woman who used to work in a business centre in Asaba but had to relocate to Onicha-Ukwuani, a rural community in Delta state after marriage had this to say about computers.

I own a computer and I can use it anytime, any day.....

There are approaches to the respondent's use of mobile phones. Among the current users of mobile phones, while few perceived it as a personal device, others considered it a general device for contacting other family members, friends, and close associates. It is a family-centred or household gadget under the control and custody of the head of the family (Father) or a male young adult in the family who is seen as more digitally compliant than other members of the family. This is in line with (MuGeDe, 2013) submissions that women in most rural communities in developing countries do not have access to and control over productive resources.

Technical support approach in the use of ICTs among rural women was also a dominant theme. While the younger women use the mobile in their everyday activities and communication, the older women depend on their children or younger relatives, especially the males for technical support. A 48-year-old woman who has a personal cell phone told us that her brother helps her in setting some of the applications such as date and time setting, checking miss calls, reading messages, saving and retrieving contacts etc. and there was no serious effort in learning how to use the applications herself. This means that access does not translate to effective use, but appropriate user skills are necessary to translate ICT access into valued development.

Another approach is that the mobile phone is often considered not a technology used to reach out in case of emergency. An 18-year-old student illustrated this approach by stating.

I make calls only when there is an emergency.... if not I mostly use my phone to receive calls, play music..... I sometimes, listen to radio....

This goes to mean that cellular phones do not afford deeper conversation probably because of air-time charges and the low-income level of rural women.

Ex-Users of ICTs

Some of the interviewees were not current users of the mobile phone, but they considered themselves users. When individuals can no longer maintain technology, meet up with the operational cost or when the motivations of owning it disappear, the individuals often stop using it and become ex-users. Among the ex-users of technologies were participants who did not acquire the gadgets themselves. There are reasons why rural women have started using mobile phones. For example, a participant aged 50, started using a mobile phone when her son in the city bought one for her for easy connectivity. She stopped using the phone about eight months before we interviewed her when the phone got bad. She couldn't repair or replace it because she hadn't the resources to do that. This corroborates with (Fernandez-Aedeval, Sawchuk and Grenier, 2017) assertion that the adoption of technology for the first time does not guarantee continuous usage. Also, maintenance of ICTs; incessant electric power failure, airtime charges and data subscription are other impediments in the use of ICTs which lead to abandonment. A 21-year-old participant said about the Internet.

.... that thing 'Internet' is very interesting, but it can drain one's pocket.

In as much as the perceived usefulness of the mobile phone, the interviewee's use of ICTs was hindered by the price of access to ICTs, which is still very high in Nigeria; maintenance of ICTs; digital illiteracy, poor quality facilities as well as incessant power failure. This means that there was a conscious and unconscious effort to withdraw from the use of mobile phones among the participants.

Never-Users of ICTs

Among the participants who had never used computers and the Internet; and had owned but stopped using mobile phones at some point were octogenarians. Out of the three octogenarians interviewed, two of them did not know what the Internet is and how it works. Though they had seen computers or their equivalents but had not used them before. This goes to mean that age is a factor in the adoption and continuous use of ICTs. This corroborates with the (FOA, 2018) assertion that older people often have less developed digital skills, they have less familiarity with ICTs as compared to the younger generation having been born at least 55-60 years ago when personal computers were not yet commonplace (Morris & Venkatesh, 2000). They are therefore generally less likely to adopt ICTs.

They mainly depended on interpersonal communication to communicate within the circle while the radio remained the channel through which to connect to people outside their networks. Though they perceived the computer and cell phone as very important development tools, they admitted that they could not use them because of their age and the technical skill required in their operations.

Determinants of Techno-use

In ascertaining the determinants of using ICTs or why people become users, three reasons were filtered; Not Losing Touch, Bandwagon and Business transactions constitute the significant reasons.

Not Losing Touch

The notion of ‘not losing touch’ with family members dominates the theme for the adoption and engagement with the ICTs. Connecting with loved ones is a great influencer for the usage and ascription of meaning to the ICTs. All the participants had found ways to stay connected to their loved ones through a particular set of communication devices. A 62-year-old woman said;

.... phone is very good. I feel closer to my children; I call every

Voice calls are *morning to ask after my children and grandchildren.* is is not

surprising because the Techno-Use data of the participants have already shown that participants use more cell phones than computers and the Internet. In one out of the five communities visited, the internet was simply not available; there was no cable or cellular internet coverage while in the other two communities, cell phone coverage existed but the costs were so high about local income levels; that access remains unaffordable for many. Mobile phone therefore becomes the most preferred communication device that rural women use to get connected to those who are already in their social network, and it limits the usability of mobile phones for wider information sharing and change in practices.

The participants managed connectivity in different ways. Few of the participants see the mobile phone as an everyday life communication tool used to stay connected, many of them see it as a device for responding to emergencies.

Bandwagon

The concern to join the bandwagon is another reason for the adoption of ICTs. A feeling of; ‘I cannot be left out’ and ‘am not that poor’ induced some participants to acquire ICTs. This is mainly reflected in the following statement:

Cell phone access became rampant in the neighbourhood, so I gave my friend's son some money to get one for me

Diffusion of Innovation Theory is applicable here since people adopt a technology simply because they had observed people within the social system adopt it and it becomes a mis-number for them not to join. The adoption and sustainability in use can bridge the gap and connect the missing link between the divides.

Business Transaction

Another reason why rural women engage with ICTs is for business transactions. However, there are differences in ICT use for economic information between participants of different age brackets. Where younger women use mobile phones for business transactions like connecting with customers, the use of the internet and computers for advancing business transactions is still a mirage. The low usage of computers and the internet across the age bracket as indicated earlier also attests to this. A 54-year-old participant said:

I don't know where to 'buy' the internet, if not; I would have bought one.....

This shows that even where access is available and affordable, low levels of awareness might be a barrier to people using internet access to improve their well-being and development. If people do not know that the internet is available or do not know in what ways it might be relevant to their life or interests, then access itself is not equal to effective usage. This result therefore suggests that though many participants used the mobile phone for communication, only a few of them used the channel for transaction purposes.

Conclusion

This study aimed to determine how rural women who are said to face three divides – rural, gender and digital negotiate and engage or disengage with ICTs. Rural women were getting more access to ICTs, especially to cell phone communications, far faster than they got access to other technologies like computers and the internet. However, using ICTs' access as a pointer or proxy for development is problematic. While ICTs can be universally available to everyone in a specific population and growth in access to improvement, such growth in access and availability may not have considered the quality of ICT facilities accessed, effective usage and affordability of access (Edge & Liyanage, 2013). Ignorant of the benefits of ICTs, the high cost of acquiring and maintaining ICTs and the services, and effective usage, were the significant barriers to ICTs' use for most vulnerable groups, such as women, living in the most remote areas.

It is quite unfortunate that ICTs are still considered an expensive venture, especially among the rural women who have the lowest level of income. They are **not easily accessible to those who would benefit the most**. Without accessibility and the identification of who will use the technology effectively and sustain the innovation, the idea of using ICTs to bridge the development gap will be of no use.

Recommendations

1. The government should employ robust low-cost technologies that can be available for rural women in Nigeria.
2. Digital inclusion policies with gender perspectives should be promoted to enable men and women to access and use ICTs equally.
3. The training of rural women is very important, especially with the adoption of ICTs to help bridge the digital divide.
4. Rural women should devise and take action to improve their situation through support-system technical skills acquisition.

References

- Edge, P. & Liyanage, H. (2013). Is the global digital divide still widening? Glitches in the mobile dream. Accessed from www.e-agriculture.org/blog/global-digital-divide-still-widening-glitches-mobile-dream).
- Ele, C. (2006). *Evangelization through Rural Development*. Nsukka: Great AP Publishers Ltd.
- Eneh, O. C. (2010). Gender digital divide: Comparative assessment of the Information Communications Technologies and literacy levels of students in Nigeria. *Information Technology Journal*, 9(1), 1739-1746
- Ezeh, N. C. & Mboso, A. (2019). Digital Migration and Social Inclusion of Senior Citizens. *Galactica Media: Journal of Media Studies*. 1(2), 62-79.
- Ezeh, N. C., Chukwuma, N. A. & Okanume, O. B. (2017). Internet and Women Self-Empowerment: Opportunities, Strategies, and Challenges. *International Journal of Social Sciences and Humanities Review* 7(1), 203-212.
- Ezeh, N. C. & Enwereuzo, N. V. (2015). "Internet Mediatization: New Opportunity for Women in Politics?" in J. Wilson and N. Gapsiso (Ed) *Overcoming Gender Inequalities through Technology Integration*. (Pp. 211-225). Pennsylvania (USA): IGI Global.

- Feldmann, V. (2006). *Leveraging Mobile Media: Cross-Media Strategy and Innovation Policy for Mobile Communication*. Verlag: A Springer Company
- Food and Agriculture Organization of the United Nations. (2011). *The State of Food and Agriculture: Women in Agriculture*. Rome, Italy: FAO.
- Ijeh, N. P.; Umukoro, E; & Amune, P. (2015) "Use of Social Media by Youths in Selected Cities of South-South Nigeria" in Wilson, D. (Ed) *Communication, Society and the Nigerian Child: Issues and Emerging Trends in the 21st Century*. African Council for Communication Education: Uyo. Pp 61-74
- Ikumola, A. D. and Okunola, R. A. (2011). **Womanhood and the media: Nigeria and the Arab world". *Journal of the Social Sciences*. 6(3), 227-234.**
- Jain, R., Ahuja, U. R. & Kumar, A. 2012. ICTS and farm women: Access, use and impact. *Journal of Agriculture and Economics*. 67(3), 385-394.
- Khalil, Mohsen, Dongier, Philippe & Qiang, Christine (2009). *Overview. Information and Communications for Development: Extending Reach and Increasing Impact*. Washington: World Bank.
- Lyytien K. and Damsgaard J (2001), In M. A. Ardis (eds). *Diffusion Software Product and Process Innovation*. New York: Business Media.
- Motes, W. C. (2010) *Modern Agriculture and its benefits-trends, implications and outlook*. Accessed from [www.globalharvestinitiative.org/Documents/Motes - Modern Agriculture and Its Benefits.pdf](http://www.globalharvestinitiative.org/Documents/Motes_-_Modern_Agriculture_and_Its_Benefits.pdf)
- MuGeDe, S. M. (2013) *The role of rural women in agriculture*. Accessed from <http://www.wfo-oma.org/women-in-agriculture/articles/the-role-of-rural-women-in-agriculture.html>
- Gandahi, R. (2016, March 27) *Role of rural women in agriculture*, Daily Pakistan Observer
- Oghogho, U. O. & Ijeh, P. N. (2017). *Studying the Pluralisation of Broadcasting in Nigeria: From Perspective to Practice. Academic research journal*. 8(3). Pp 186-203. SAVAP International, Lodhran City. https://www.researchgate.net/publication/366165840_Studying_the_Pluralisation_of_Broadcasting_in_Nigeria_From_Perspectives_to_Practice
- Omeire, E. (2018) *Rural women and agricultural production in Imo state south-eastern Nigeria: problems and prospects. International Journal in Management and Social Science*, 09(5), 366-369.
- Owuamalam, E. O., Ezeh, N. C. & Eze, E. (2020). *Proper Hand Washing Realities in Select Nigerian Communities Amidst Covid-19 Pandemic. NTAtvc Journal of Communication*. 4(2); 47 – 56.
- Rogers, E. (2003). *Diffusion of Innovations*. (5th ed). New York: Free Press:
- Rogers E. M. (1997). *Diffusion of Innovations Theory*. Accessed on March. 6, 2016, from <http://nmlm.gov/pnr/eval/rogers>.
- Taske, C. & Plude F. 2011. *Experiencing Social Media across Generations. Media Development*, 58(1), 38-41.
- Wei, R. (2013) *Mobile media: Coming of age with a big splash Volume. Mobile Media and Communication*. 1(1), 50-56.
- Treinen S. & Elstraeten, A. V. (2018). *Gender and ICTs: Mainstreaming gender in the use of information and communication technologies (ICTs) for agriculture and rural development*. Rome, Italy: The Food and Agriculture Organization of the United Nations

Ufuophu-Biri, E. & Ijeh, N. P. (2021). The Place of Digital Nativity and Digital Immigration on Internet Accessibility and Usage by Students and Lecturers of Tertiary Institutions of Learning in Delta State, Nigeria. *Academic journal of interdisciplinary studies*. 10(1). Pp 214-227. DOI: <https://doi.org/10.36941/ajis-2021-0019>