Use of Electronic Mail by Educated Older Adults in Oyo State, Nigeria

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Abstract

This study presents preliminary findings on the use of e-mails by educated older adults in Nigeria-based areas of residency. This study is based on a quantitative survey (n = 167) which investigated the level of awareness and use of e-mails, reasons for use and non-use, as well as continuance and intention to use e-mail by older adults in three settings (urban, semi-urban, and rural areas) of Oyo state, Nigeria. A questionnaire was used to collect data. Results showed that about half of the educated older adults were aware of e-mail with a higher percentage of those aware residing in the urban area. There was a low level of usage of e-mail, especially among the semi-urban and rural dwellers. The major purpose of using e-mail was to receive alerts for banking transactions. E-mail users at the three locations intended to continue using e-mail, although the intention was stronger among the semi-urban and rural dwellers. Most non-users in the semi-urban and rural locations were not aware of e-mail, while most did not use e-mail because they had alternative means of communicating with people and saw no need for it. Concerns about the security of e-mails, lack of awareness of the benefits of using e-mail, and lack of literacy in e-mail use are some other reasons for non-use. Most of the non-users had the intention to use e-mail in the future, especially those in urban and semi-urban areas. It is recommended that efforts be geared towards creating more awareness about the importance of e-mail among the older population as well as developing training interventions on the use of e-mail, especially among the semi-urban and rural dwellers.

Keywords: Digital well-being; E-mail use; ICT; Educated Older adults; Oyo State, Nigeria

Introduction

Research is emerging on opportunities to improve the lives of older adults through increased technology adoption and use, as the aging population is increasingly becoming a focus of attention in both developed and developing countries. Rudnicka et al. (2020) describe an ageing global population as the most important medical and social demographic problem worldwide. Hence, more attention is now being given to studies on Gerontechnology, which is the study of technology and aging towards ensuring good health, full social participation, and independent living for older adults throughout their entire life span (Chen, 2020; Huang & Oteng, 2023). It involves a study of older adults from the viewpoint of living in a changing technological society and the study of technologies from the viewpoint of their potential to improve their daily living and facilitate older adults' social participation (Halicka & Surel, 2021). The multidisciplinary field has received increased attention in recent years because it can help older adults identify and slow down the effects of age-related physical and cognitive difficulties (Sale, 2018).

It has been noted that technological innovation enhances the quality of life for older adults and people with disabilities, while also creating independence, financial stability, and economic and business opportunities (Cotten, 2017; Mostaghel & Oghazi, 2017). Gerontechnology has enormous potential to ensure better care and improved quality of life for older adults; however, it has been noted that older people do not show as much interest in adopting new technologies as younger populations (Petersen et al., 2023; Yusif et al., 2016). Even though technology adoption has been proffered as a solution to many of the problems associated with ageing; the elderly must accept and use the technology in order to address these problems. Improving uptake and use of internet-based digital technologies offers a way to reduce older adults' loneliness, social isolation, and technology gaps through connections with peers, friends, family, and community. It has been observed that digital inclusion and social belongingness are some of the main reasons why older adults use Internet technologies (Cotten, 2017; Wu et al., 2015).

Information and Communication Technologies (ICTs), such as electronic mail (Email) play essential roles in all aspects of lives, as they have changed the way people relate with one another, work, and manage their social lives (Haase et al., 2021; Roztocki et al., 2019). Email is a computer-based application for the exchange of messages between users via the Internet. E-mail could be referred to as the electronic equivalent of a letter but with the advantages of convenience, timeliness, and flexibility. E-mail is one of the most used ICTs, as it allows users to send and receive messages from around the world at any time of the day. E-mail has been breaking down barriers by encouraging people to exchange information with a far larger and more diverse group of people. The numerous benefits of ICT products, such as E-mail, vary considerably depending on users' abilities and attitudes toward human-computer interaction due to the ability to understand, access, trust, and use technologies, which are key factors that influence successful adoption and use (Omotayo, 2015). However, in a society where technology changes at an exponential rate, older adults are often unaware, or not considered in the design, of evolving technologies that are mainly targeted at the younger population (Zhang, 2023).

As the global population ages and life span increases, older adults comprise a growing component of both current and potential Internet and e-mail users. The increase in aging populations and the use of computer-related technology have spawned research regarding older adults' use of the Internet. Previous studies have reported on the use of the Internet and e-mail by the younger population especially students (Bozzola et al., 2022; Vogels et al., 2022). However, it has been observed that many older adults are increasingly using the Internet, especially social media and electronic mail (Amundsen, 2021; Anderson & Perrin, 2017; Campaña, & Ortega, 2021; Cotten, 2017; Vaportzis et al., 2017; Wong et al., 2017). However, these studies differ in how they define and bind their populations, which poses challenges for comparability across countries and regions. Moreover, very few studies have specifically investigated the use of e-mail by the elderly who are believed not to be technologically savvy (Anderson & Perrin, 2017; Brondani et al., 2011). Specifically, no known study was found to have investigated the use of email by this population in Nigeria.

Also, even though e-mail is one of the most widely used Internet applications, very little is known about how older people or the elderly in Nigeria interact with e-mail systems in their daily lives. Specifically, preliminary investigation in Ibadan reveals that e-mail is one of the Internet applications not commonly used by older people, who have not grown up with ICTs and require a greater effort to learn to use it than younger people. There is a general assumption that

many older people are not computer literate and therefore are not familiar with e-mail. However, this assertion may no longer be true with an increase in the number of older adults adopting e-mail. Scholars have focused on older adults' ICT usage generally (Campaña, & Ortega, 2021; Marston et al., 2019; Wong et al., 2017, 2018), and some of these studies have reported on the inequality of ICT use among urban and rural older adults (Marston et al., 2019), and more usage of ICTs by urban older adults than their rural counterparts (Berner et al., 2015; Hargittai et al., 2019). Understanding the use of e-mail by older adults is significant both for having a comprehensive view of their ICT usage and for knowing the type of support digital technology developers, firms, and government can realistically provide for this population. Having empirical data to know the level of use of e-mail by this population would help design workable interventions that could promote the use of e-mail among this population thereby enhancing their well-being through increasing their social networking activities.

Older adults are less likely to adopt new technology unless they see the benefits. They would be willing and eager to adopt new technology when the usefulness and usability outweighed feelings of inadequacy and apprehension. Studies have shown that older adults all over the world are living longer because of assistive technologies. However, many nations, especially developing countries have yet to institute systems and policies to match this reality. Instead, the high cost of ICTs, irregular or lack of Internet accessibility, especially in rural communities, older people's lack of ICT skills, willingness to adopt new skills, and reluctance to use technologies, and other features of daily life that could isolate and marginalize older adults are yet to be addressed. To build a more just society steps must be taken to prevent social isolation of every group in society, including older people. Any time a particular group is isolated or marginalized it is a problem for society. Taking steps to ensure all individuals, no matter their age, are treated as equal members of society would help nations achieve the ideal of a just society. Hence, the need to investigate the use of e-mail by educated older adults in three settings (urban, semi-urban, and rural areas) in Oyo state, Nigeria. Specifically, the study investigated their awareness and use of e-mails, reasons for use and non-use as well as continuance intention to use. The study provided answers to the following research questions:

i. What are the types of devices used by older adults?
ii. What is the level of awareness of email by older adults?
iii. What is the level of use of email by older adults?
iv. For what purpose do older adults use email?
v. What are the reasons for using e-mail?
vi. Do older adults using email have the intention to continue to use it?
vii. What are the reasons for the non-use of e-mail by the non-users?
viii. Do non-users have the intention to use e-mail in the future and what are the reasons that could make them use email in the future?

Literature Review

The elderly population is one of the fastest-growing population groups. According to the World Health Organization (2022), by 2050, the world's population of people aged 60 years and older will be about 2.1 billion). Along with this rise in the number of older adults is an increase in the

number of those who use ICTs. With the rise in technology utilisation, specifically the Internet, the elderly can use the Internet for information, connectivity, independence, wellness, health care purposes, and social activities, among others. Scholars (Huang & Oteng, 2023; Morrow-Howell et al., 2020; Peek et al., 2016) have identified technology as one of the solutions to the problems associated with aging because technology offers opportunities to provide support and thereby enhances daily living and well-being of older people. As the aging concept is continuous, technologies can assist elderly adults in improving their living conditions, thereby promoting healthy life, and living independently for a longer period of years in their various settlements or communities. The ability to use ICT is assumed a prerequisite to living in the information age; therefore, it is one of the tools that can ensure active aging and socioeconomic participation for elderly people. Modern technologies such as mobile phones, computers, e-mail, home electronic appliances, and many other assistive technologies offer a wide range of assistance for older adults' independent living.

Studies on the use of ICTs by older adults are multidisciplinary as many professionals from different disciplines and in different parts of the world have investigated the use of ICTs by this population. Some of these studies have been general or specific. One of those early studies was conducted by Gatto and Tak (2008). The authors examined the benefits and barriers to ICT use among 58 older adults in the USA aged 59 to 85 years. A sense of connectedness was the major benefit of ICT use reported by the older adults, as they were able to communicate with family and friends, reconnect or make new friends. Other benefits reported included utility, satisfaction, and positive learning experiences. However, frustration from pop-ups, spam, and unwanted e-mails was a major barrier to the use of ICTs, while many were also concerned about their privacy online. Moreover, physical and mental limitations, as well as time spent learning and using the technologies, were also reported as barriers. Another study by Neves et al. (2013) investigated the adoption, use, and non-use of ICTs by 500 Portuguese older adults aged over 64 years. The study focused mainly on mobile phones, computers, and the Internet. About 80% of the older adults used a mobile phone, and of this, 40.2% and 24.9% used it to communicate with family and friends respectively, while 21.6% used it for emergencies. Also, 13% of the Portuguese older adults used computers, while just 10% used the Internet. Reasons for non-usage of ICT by the Portuguese older adults were not age-related, but mainly functional and attitudinal as findings showed that in the three categories, most non-users either did not see ICT use as a necessity or were unable to use them.

However, the findings of another study by Chang et al. (2015) differ from these two earlier studies as they found an improvement in the use of the Internet by older adults. Chang et al. examined Internet use by 567 older adults aged 60 years and above living in a county in South California, USA. The findings showed that about 60% used the Internet and over 82% used it for e-mail, while 61% used it for communication with friends and family. Among non-users, about 64% reported their inability to use the Internet, while about 50% reported a lack of access to the Internet, followed by mistrust and privacy concerns (25%). The presence of a computer at home, age, education, ethnicity, and a job requiring computer use were important predictors of Internet use by older adults, which were, somehow, contrary to the findings of Neves et al. (2013) among Portuguese older adults.

A later study by Peek et al. (2016) showed the availability of alternatives as an important factor to consider in understanding the non-usage of ICTs by older adults. This study, conducted

in the Netherlands, used a qualitative approach to explore factors influencing the use of different technologies among older adults between the ages of 68 and 95 years. The various technology types investigated included those supporting daily living, communication, mobility, personal health, and leisure activities. The findings showed that although many of the older adults reported experiencing benefits in the use of technology to perform daily tasks, stay physically active, and communicate with others, technology was only one of multiple options available to them. Many noted that they did not have to use technology due to the availability of other alternatives. Overall, although they faced challenges arising from independent living, the level of technology used by these older adults was influenced by personal challenges encountered while aging, behavioral options, the physical environment, personal thoughts on the use of technology, and the influence of organizations and social networks.

Sayago and Blat (2010) specifically focused on the use of e-mail by 388 older adults in Barcelona (Catalonia, Spain). The 3-year ethnographic study was aimed at revealing and explaining real-life e-mailing. The ethnographic investigation spent three years analysing the e-mail habits of adults between 64 and 80 years old. The researchers studied users in their everyday interactions, observing how they used the technology, speaking with them (informal conversations, interviews in groups or individually), and taking notes on almost everything. The purpose was to propose an e-mail design that supports older adults' peculiarities rather than the one designed in laboratories limited to making prototypes. The study investigated the use of e-mail by older adults in terms of accessibility, frequency, type of content, relation with other technology and activities, communication models, motivations, and interactive experiences. The study found that older adults felt motivated to use ICTs as they saw it as an important element for feeling part of society and fighting against the isolation that can increase with age. They used e-mail to communicate with their social circles, but not as a means of establishing relationships with people they do not know. The adults were encouraged to use e-mail by key members of their social circles (children and grandchildren) and had a strong interest in e-mailing to be or remain closer with them. The study also found that making e-mail easier to use was more important than increasing the size of the elements on the interface. This is clear from the importance that older people placed on their independence as they did not want to depend on someone else to be able to send an e-mail and they wanted to use the same mechanisms as other people. The study by Sayago and Blat revealed that older people wished to be independent and that e-mail had a strong impact on the adult's quality of life, contradicting the findings of some previous studies (e.g., Dickinson and Gregor, 2006) that showed computer use has no demonstrated (and measurable) impact on the well-being of older adults.

From the literature reviewed, it is evident that few studies have focused specifically on the use of e-mail by older adults; hence, the sparse literature review and the need for this study. More importantly, no known study was found to have investigated the use of e-mail by older adults in Nigeria. Also, most of the studies were conducted in developed countries where there is a high literacy level, economic and technological support for the elderly. The findings also differ concerning the countries, educational status, and economic capabilities of the adults.

Methodology

A survey research design was adopted for the study. The location of the study is three towns in Oyo State, Nigeria (Ibadan metropolis - urban, Saki West - semi-urban, and Igboora – rural). The population of Oyo State as of the last census conducted in 2006 was 5,580,894, while the projected population as of 2022 was 7,976,100 (City Population, n.d.). Oyo State was chosen because the state is one of the largest states in Nigeria and is considered an educationally advantaged state; hence, the possibility of getting educated older adults. The locations were selected to have a comparison among the three classifications, to know if there would be differences in the use of e-mail based on the location of the older adults. The population of the study is educated older adults above the age of 60. The educated older adults were chosen because it was believed that only this category of older adults would be able to use email because of their educational level. Previous studies (e.g., Amundsen, 2021; Busch et al. 2021; Omotayo, 2015, 2018) have shown that uneducated older adults who used smartphones and computers did not use the devices to send emails.

The Ibadan metropolis (urban) has five Local Government Areas (LGA), namely Ibadan North, Ibadan South East, Ibadan South West, Ibadan North West, and Ibadan North East. Saki (semi-urban) is the headquarters of the Saki West local government area, while Igboora (rural) is the headquarters of Ibarapa Central LGA. According to the 2022 population projection (City Population, n.d.), the Ibadan metropolis has a population of 1,919,600, Saki has 390,500, and Igboora has 147,600. However, the population of the elderly in the LGAs is indeterminate; hence, 200 older adults were selected using convenience and snowball sampling techniques. A self-constructed questionnaire, containing both open and close-ended questions, was used for data collection. Some measurement items on reasons for using email (Berkowsky et al., 2018), benefits of using email (Berkowsky et al., 2018), continuance use of email and continuance intention to use of email (Haase et al., 2021; Yan et al., 2021) were adopted. For the users, the instrument collects information about the older adults' demographics (age, gender, ethnicity, educational level, marital status, religion, occupation, financial and health status, devices used, use of e-mail, frequency of e-mail use, purposes used for, motivation for use, benefits derived from using, challenges face for using, and intention to continue to use. For the non-users, the instrument collects information about their demographics, awareness of e-mail, reasons for non-using e-mail, and intention to use e-mail in the future. The form consisted of five-point Likert-type scale items and open-ended questions, ranging from strongly disagree (1) to strongly agree (5).

The content and face validity of the instruments were established by two lecturers from the Department of Data and Information Science, University of Ibadan, Nigeria. A pilot test was conducted with 20 respondents from Igbeti in Oyo state, which is outside the scope of the study. The internal consistency was established through the Cronbach Alpha test of reliability, with the alpha coefficient values of the constructs exceeding 0.70. This justifies that the questionnaire has high reliability as an instrument that can be termed reliable if all the values are more than or equal to 0.7 (Hair et al., 2011).

Results

A total of 167 older adults participated in the study. Table 1 presents the descriptions of the respondents. Almost 50 percent of the respondents were from the Ibadan metropolis which represents the urban category. The majority were between 61 to 70 years of age (65.2%) and mostly males (56.3%). A breakdown of the educational status showed that most (32.9%) had Bachelor's degrees. Also, the majority were married (74.3%), mostly Christians (68.3%), and Civil Servants (67.1%). A large percentage earned between ₦51,000 to ₦100,000 (47.9%). Over 50 percent reported not having any existing ailment and rated their health status as Good (55.7%), very good (21.6%), and fair (18.6%), while less than 50% rated themselves as being computer literate.

Table 1: Demographic Characteristics of the Respondents

Characteristics	Categories	Frequency (N=167)	Percentage
Location	Ibadan (Urban)	79	47.3
	Saki (Semi-Urban)	51	30.5
	Igboora (Rural)	37	22.2
Age	61-65 years	61	36.5
	66-70 years	48	28.7
	71-75 years	27	16.2
	Above 75 years	31	18.6
Sex	Male	94	56.3
	Female	73	43.7
Educational qualification	Basic (Primary to Grade II/I)	36	21.6
	NCE	51	30.5
	OND	2	1.2
	HND	4	2.4
	Bachelors	55	32.9
	Masters	17	10.2
	Doctoral	2	1.2
Marital status	Married	124	74.3
	Separated	7	4.2
	Divorced	4	2.4
	Widowed	32	19.2
Religion	Christianity	114	68.3
	Islam	47	28.1
	Traditional	4	2.4
	No Religion	2	1.2
Occupation	Civil Servant	112	67.1
	Professional	9	5.4
	Trading	27	16.2
	Artisans	18	10.8
	Others	1	0.6
Income (monthly)	Less than 50,000	26	15.6
	51,000 – 100,000	80	47.9

	101,000 – 200,000	41	24.6
	Above 200,000	20	12.0
Health status	Poor	1	0.6
	Fair	31	18.6
	Good	93	55.7
	Very Good	36	21.6
	No response	6	3.5
Existing ailment	Yes	69	41.3
	No	85	50.9
	No response	13	7.8
Computer literacy	Yes	79	47.3
	No	87	52.1
	No response	1	0.6

Research Question 1: What are the types of devices used by older adults?

Table 2 shows a breakdown of the devices used and used by location. More than 70% of respondents in each location used smartphones. More older adults living in semi-urban and rural areas used the basic phones (non-android) than in the urban areas. Only a few used laptops (19.0% in urban, 10.2% in semi-urban, and 13.5% in rural areas). None in the rural area indicated the use of a desktop computer.

Table 2: Types of Devices Used

Types of Devices	Use (%) (N=167)		
	Urban	Semi-Urban	Rural
Smartphone	70.9	75.5	81.1
Mobile (basic phone)	50.6	81.6	91.9
Laptop	19.0	10.2	13.5
iPad	2.5	10.2	13.5
Desktop Computer	8.9	4.1	0.0

Research Question 2: What is the level of awareness of email by older adults?

Table 3 presents the results on the awareness of e-mail. Out of a total of 167, 890 (53.3%) indicated awareness of e-mail, and 78 (46.7%) indicated non-awareness. Out of 89 respondents who were aware of e-mail, almost 60.0% resided in the urban area.

Table 3: Awareness of E-mail

Category	Frequency/Percentage		
Awareness (N=167)	Urban	Semi-Urban	Rural
Yes (N=89)	53 (59.6)	23 (25.8)	13 (14.6)
No (N=78)	26 (33.3)	28 (35.9)	24 (30.8)

Research Question 3: What are the emails used and the level of use of email by older adults?

Out of a total of 167 who responded to the use of email, 67 (40.1%) were users, while 100 (59.9%) were not (Table 4). Also, the urban respondents (62.7%) used e-mail more than semi-urban (20.9%) and rural respondents (16.4%). The majority of e-mail users in the urban area had been using e-mail for more than 10 years (47.2%), and between 5 to 10 years (53.8% and 72.7%) in the semi-urban and rural areas respectively. None of the respondents in the rural and semi-urban locations reported having used e-mail for more than 10 years. Most e-mail users in the urban, semi-urban and rural settings used it frequently (47.2%, 53.8%, and 63.9% respectively). A total of 100 participants reported not using e-mail (Table 4). A breakdown of their locations showed that 37.0% were urban, 37.0% semi-urban, and 26.0 rural locations.

Table 4: Use of E-mail

Category	Frequency/Percentage			
Usage of e-mail (N=167)	Total	Urban	Semi-Urban	Rural
Yes	67 (40.1)	42 (62.7)	14 (20.9)	11 (16.4)
No	100 (59.9)	37 (37.0)	37 (37.0)	26 (26.0)
Length of use (%)				
Less than 5 years		13.9	46.2	27.3
5 to 10 years		38.9	53.8	72.7
More than 10 years		47.2	-	-
Frequency of use (%)				
Occasionally		36.1	46.2	27.3
Frequently		47.2	53.8	63.9
Very frequently		16.7	-	9.1

The two types of e-mail accounts used were mainly Gmail and Yahoo Mail (Table 6).

Table 6: Types of E-mail Accounts and Devices Used

Category	Urban	Semi-Urban	Rural
	%	%	%
E-mail accounts			
Yahoo mail	38.9	42.9	54.5
Gmail	86.1	92.9	90.9
Outlook	8.3	-	18.2
AOL	2.8	-	-
Mail.com	2.8	-	-

Research Question 4: For what purpose do older adults use email?

Table 7 shows the purposes of using e-mail. At the three locations, more respondents used e-mail to receive bank alerts than in all other activities. Also, most respondents in semi-urban and rural locations used e-mail to communicate with family and friends more than those in urban areas. The observed association between the location of respondents and the purpose for using

e-mail is statistically significant in the three categories discussed above. Hence, it can be said that there is a tendency for older adults in semi-urban and rural locations to set up e-mail accounts with the purpose of communicating with family and friends and receiving bank transaction alerts more than older adults in urban locations.

Table 7: Purpose for Using E-mail

Purpose	Urban	Semi-Urban	Rural	Chi-Square	p-value	Decision
	%	%	%			
Communicate with family	50.0	92.9	100.0	17.143	0.000	Significant
Communicate with friends	41.7	92.9	81.8	16.062	0.000	Significant
Communicate with physician	25.0	28.6	45.5	1.683	0.431	Insignificant
Bank transaction alerts	66.7	92.9	100.0	10.000	0.007	Significant
Official information (pension)	41.7	28.6	36.4	0.502	0.778	Not significant
Information from church/mosque	36.1	35.7	36.4	0.023	0.988	Not significant

Research Question 5: What are the reasons for using e-mail?

Respondents were also asked to state reasons for using e-mail for these activities and responses were collected on a 5-point Likert scale where 1-Strongly disagree, 2-Disagree, 3-Not sure, 4-Agree and 5-Strongly agree. However, since none of the respondents selected 'Not sure', this category was deleted and a 4-point Likert scale was used where 1-Strongly disagree, 2-Disagree, 3-Agree, and 4-Strongly agree. Both agree and strongly agree were merged to reflect 'agree' while both disagree and strongly disagree were also merged to reflect 'disagree'. The Chi-Square results (Table 8) show that there is a statistically significant tendency for semi-urban and rural older adults to use e-mail than urban older adults because they had no choice ((χ^2=17.557, p=0.000), they found it easier to use it to communicate with their children (χ^2=11.455, p=0.003) and family members (χ^2=12.662, p=0.002), the manual postal system no longer works (χ^2=11.883, p=0.003) and they enjoyed reading e-mails (χ^2=12.189, p=0.002).

Table 8: Reasons for Using E-mail

Reasons	Urban		Semi-Urban		Rural		χ^2	p-value	Decision
	A (%)	D (%)	A (%)	D (%)	A (%)	D (%)			
My family uses it to communicate with me so I have no choice	42.4	57.6	92.3	7.7	100.0	0.0	17.557	0.000	Significant
I find it easy to use to communicate with my children	62.4	37.6	100.0	0.0	100.0	0.0	11.455	0.003	Significant
I find it easy to use to communicate with my family	53.0	47.0	92.3	7.7	100.0	0.0	12.662	0.002	Significant

The manual postal system no longer works, so I have to learn to use it to communicate with my family	61.3	38.7	100.0	0.0	100.0	0.0	11.883	0.003	Significant
I use it because of the convenience as I can send mail anytime any day in the comfort of my home	66.7	33.3	84.6	15.4	100.0	0.0	5.734	0.057	Insignificant
I enjoy reading e-mails	51.5	48.5	100.0	0.0	90.0	10.0	12.189	0.002	Significant
My acquaintances prefer using it to communicate with me	43.3	56.7	23.1	76.9	60.0	40.0	3.269	0.195	Not significant
A = Agree, D = Disagree									

Research Question 6: Do older adults using email have the intention to continue to use it?

Table 9 presents the breakdown of the users' intentions to continue using e-mail. Overall, most of the users of e-mail in the three locations expressed their intention to continue using e-mail as a mode of communication, although the Chi-Square results show this intention to be stronger among the semi-urban and rural respondents. It was also observed that in all the locations, a high percentage of respondents disagreed that they would stop e-mail usage soon but generally agreed that only failing health could affect their use of e-mail.

Table 9: Continuance Use of E-mail

Continuance Use of E-mail	Urban		Semi-Urban		Rural		χ^2		
	A (%)	D (%)	A (%)	D (%)	A (%)	D (%)		p-value	Decision
I intend to continue using e-mail	88.9	11.1	100.0	0.0	100.0	0.0	2.833	0.243	Not significant
I will continue to use e-mail to communicate with people	74.1	25.9	100.0	0.0	100.0	0.0	7.212	0.027	Significant
My usage of e-mail for communication is sure	74.1	25.9	100.0	0.0	100.0	0.0	7.212	0.027	Significant
I do not intend to continue to use e-mail for a long time	16.0	84.0	7.7	92.3	0.0	100.0	2.256	0.324	Not significant
I am already used to using e-mail to communicate so I do not see myself stopping	77.8	22.2	92.3	7.7	72.8	27.2	1.698	0.428	Not significant
It is only failing health that can make me stop using e-mail to communicate	74.1	25.9	100.0	0.0	90.9	9.1	4.921	0.085	Not significant

Research Question 7: What are the reasons for the non-use of e-mail by the non-users?

Non-users of e-mail were asked reasons for not using the e-mail. Table 10 shows that more than 70% of respondents in each semi-urban and rural location reported not being aware of e-mail, whereas almost 60% of respondents in the urban location disagreed that lack of awareness was the reason for not using e-mail. Chi-square results ($\chi^2 = 8.532$, $p = 0.014$) show that this tendency in the different locations is statistically significant. The table also reveals that in each of the three locations, the majority of respondents agreed that they did not use e-mail because they had alternative means of communicating with people and saw no need for using e-mail. This was followed by concern over the security of their e-mails, lack of awareness of the benefits of using e-mail, and lack of literacy in e-mail use. Chi-square tests, however, showed no significant association between the locations of the respondents and these reasons.

Table 10: Reasons for Not Using E-mail

	Urban		Semi-Urban		Rural		χ^2	p-value	Decision
Reasons for not using e-mail	A (%)	D (%)	A (%)	D (%)	A (%)	D (%)			
I am not aware of it	41.2	58.8	70.3	29.7	73.1	26.9	8.532	0.014	Significant
I am not computer literate	70.6	29.4	78.4	21.6	80.8	19.2	0.989	0.610	Not significant
I do not have the facilities (smartphone, computer, Internet) to use it.	51.5	48.5	61.1	38.9	53.8	46.2	0.698	0.706	Not significant
I see no need for it	94.1	5.9	100.0	0.0	96.2	3.8	2.113	0.348	Not significant
I am not aware of its benefit to me	79.5	20.5	78.4	21.6	88.5	11.5	1.170	0.557	Not significant
I have other means I use to communicate with people	97.1	2.9	100.0	0.0	100.0	0.0	1.872	0.392	Not significant
I am not sure of the security of the emails sent on it.	82.4	17.6	97.2	2.8	88.5	11.5	4.191	0.132	Not significant
I am afraid of falling victim to spammers or hackers	85.3	14.7	91.6	8.4	88.5	11.5	0.700	0.705	Not significant

Research Question 8: Do non-users have the intention to use e-mail in the future and what are the reasons that could make them use email in the future?

Table 11 shows that most of the non-users had the intention to use e-mail in the future, whereas higher percentages were observed among urban and semi-urban non-users. In all three locations, most non-users would consider using e-mail if there are no alternative means of communicating with people. Moreover, compared with rural non-users, more urban and semi-urban non-users intend to use e-mail in the future if their children/family consider it necessary; if they are confident of the security of their e-mails; and if they can acquire the necessary skills and resources to use it. Chi-square tests did not, however, show any statistically significant association between the location of the non-users and the intention to use e-mail.

Table 11: Intention and Reasons to Use E-mail by Non-Users

	Urban		Semi-Urban		Rural		χ^2	p-value	Decision
Reasons/intention to use e-mail in the future	A (%)	D (%)	A (%)	D (%)	A (%)	D (%)			
I may consider using e-mail in the future if my children/family request me to use it	87.5	12.5	73.0	27.0	61.5	38.5	5.221	0.074	Not significant
I may consider using e-mail in the future if I can acquire the skills needed to use it	74.2	25.8	81.1	18.9	61.5	38.5	3.002	0.223	Not significant
I may consider using e-mail in the future If I can acquire the resources needed to use it	61.3	38.7	80.6	19.4	57.7	42.3	4.497	0.106	Not significant
I may consider using e-mail in the future if I am confident of the security of my emails	74.2	25.8	82.9	17.1	61.5	38.5	3.518	0.172	Not significant
I may consider using e-mail in the future if I have no other means of communicating with people	93.5	6.5	97.3	2.7	88.5	11.5	1.995	0.369	Not significant

Discussion of the Findings

This study presents preliminary findings on the use of e-mails by older adults in Nigeria based on three locations. A total of 167 respondents drawn from urban, semi-urban, and rural areas participated in the study. Most of the respondents used smartphones, with more living in semi-urban and rural areas possessing basic phones (non-android). This result is an improvement on the findings of Omotayo (2018), which reported about 42% possession of smartphones by older adults living in Saki, which is a semi-urban area. However, very few used laptops with no adults living in the rural area indicating possession of a desktop computer. This confirms the findings of previous studies (e.g., Alexopoulou, 2020;) about the low-level possession of computers by the aged population, especially those living in rural communities, even though the findings of Marston et al. (2019) showed that majority of the older adults sampled from urban and rural locations in the United Kingdom (UK) and Canada owned a personal computer (PC) and that the frequencies of participants across each country were nearly equal, as those living in rural areas in the UK were slightly more likely to own a PC than those in urban areas in Canada.

About half of the adults indicated awareness of e-mail; with most residing in the urban area. Also, out of those who used e-mail, the urban respondents were the most represented. The association between the location of respondents and awareness and use of e-mail is statistically significant; hence, there is a tendency for urban, semi-urban, and rural older adults to use e-mail more than those in rural areas. These findings were not surprising considering that previous studies have reported digital inequality among older adults (Hargittai et al., 2019) and more

usage of ICTs by urban older adults than their rural counterparts (Anderson & Perrin, 2017; Berner et al., 2015; Hunsaker & Hargittai, 2018).

The major purpose for using e-mail by the respondents in the three locations was to receive alerts for bank transactions, and this was followed by communication with family and friends. The observed association between the location of respondents and the purpose for using e-mail is statistically significant at the three locations. Chi-square results also showed a tendency for more respondents in semi-urban and rural areas to use e-mail for this purpose than the urban dwellers. The use of e-mail for such less personal communication has been reported by previous studies, e.g., Alexopoulou (2020), Bixter et al. (2019), and Hunsaker & Hargittai (2018), among others. For instance, using a qualitative approach, Bixter et al. (2019) attempted to understand older adults' use and non-use of technologies for social communication. Findings showed that participants agreed that compared to other means of communication, e-mail was more effective in saving time and useful for less personal communication such as confirmation of air tickets or receipt of bank alerts as seen from findings from the current study. However, maintaining personal relationships was believed to be better achieved through other forms of communication than e-mail. Other studies, however, have reported the use of e-mail for more personal communication such as with family and friends. For example, Jøranson et al. (2023) and Nedeljko et al. (2021) reported that older adults used ICTs to communicate with family and friends respectively. Also, in a similar study, which did not investigate location differences, Vroman et al. (2015) investigated older adults' online presence. The study reported that most respondents used ICTs to communicate with family, maintain social connections, access health information, and other routine activities. In the same vein, more than the urban dwellers, the majority of semi-urban and rural dwellers in the current study reported that they used e-mail for these purposes mainly because they had no choice because the manual postal system no longer worked and that they found it easier to use e-mail to communicate with their children and other family members.

The findings also revealed that most e-mail users at the three locations expressed their intention to continue using e-mail as a mode of communication, although the Chi-Square results show this intention to be stronger among the semi-urban and rural respondents. In all the locations, a high percentage of older adults disagreed they would stop using e-mail soon but generally agreed that only failing health could affect their use of e-mail. This confirms the findings of previous studies (e.g., Anderson & Perrin, 2017; Hänninen et al., 2021; Ma et al., 2015; Marston et al., 2019; Álvarez-Dardet et al., 2020) that more older adults are adopting ICTs.

Most of the adults who had not used e-mail were from the urban area and semi-urban areas respectively. Most of the non-users residing in semi-urban and rural locations reported not being aware of e-mail as the major reason for non-use. A statistically significant association between reasons for not using e-mail and the location of respondents was observed only in their awareness of the e-mail. However, most of the non-users had the intention to use e-mail in the future, whereas higher percentages were observed among urban and semi-urban non-users. The Chi-square tests did not, however, show any statistically significant association between the location of the non-users and the intention to use e-mail in the future. Even though inferential statistics showed no significant differences based on locations, findings from this study showed that the availability of other means of communication and concern over the security of e-mails were major reasons reported for the non-usage of e-mails. Hence, the majority of non-users in

this study would not consider using e-mail for any form of communication unless there are no alternatives available.

The availability of alternatives to the use of technology by older adults is increasingly being given attention in research. Supporting this finding from the current study, Peek et al. (2016) reported that among older adults aging in place, the use of technology was only one of the options available to them in performing daily tasks as many of them used other available alternatives. Richardson's (2018, p.17) findings on older adults' use of the Internet also suggest that "the belief that digital technology is beneficial or indispensable appears to be very much in the eye of the beholder" as many non-users reported being able to communicate, engage in shopping, find information and participate in other activities using other available alternatives to the Internet. It is not completely certain whether the availability of alternatives is the major reason for the non-usage of e-mail by non-users in the current study. However, it might be reasonable to understand their use of available alternatives based on findings on some other reasons reported by the participants – lack of computer literacy; fear over the security of their e-mails, and falling victim to hackers, among others, could be the reasons why most of the non-users were not using e-mail.

Moreover, compared with rural non-users, more urban and semi-urban non-users intended to use e-mail in the future if their children/family consider it necessary; if they are confident of the security of their e-mails; and if they can acquire the necessary skills and resources to use it. However, these differences in intentions were not statistically significant. These findings conform with the findings of previous studies; e.g., Amundsen (2021) and Wu et al. (2015). Amundsen (2021) also observed that the COVID pandemic made many older adults adopt the use of technologies during the quarantine and lockdown containment measures when it became necessary to avoid social interactions. Wu et al. (2015) also established that independence and digital inclusion motivated older adults to take up using the Internet.

Also, more non-users in each location cited a lack of computer literacy as a reason for not using e-mail. On the one hand, this is surprising because most of the participants in each location (users and non-users) used at least a smartphone. This shows that the non-users were using their smartphones for other purposes. Previous studies have supported this finding by reporting that e-mailing is one of the activities not frequently carried out on smartphones by older adults (Busch et al. 2021; Omotayo, 2015; 2018). For example, Busch et al. (2021) studied smartphone use among older adults in Norway and reported social media activities, reading news, and audio/video calls as the top three activities carried out on smartphones while e-mailing was in the distant sixth position. Omotayo (2018) also revealed that audio calls, text messaging, social media, and taking photos as the top activities on smartphones by semi-urban older adults, while e-mailing was one of the least common activities for which smartphones were used. Vaportzis et al. (2017) also observed that most of their participants were eager to adopt new technology and willing to learn using a tablet. However, they voiced apprehension about the following: security; lack of clarity in instructions and guidance; lack of knowledge and confidence; health-related barriers; cost; too much and too complex technology; feelings of inadequacy; comparison with younger generations; negative features of tablets; among other issues. Findings from this current study suggest that participants likely believed that a higher level of literacy is needed for e-mail compared to other activities such as voice calls, text messaging, and the use of social media apps.

The second issue that likely explains their use of available alternatives is the fact that the majority of non-users reported fears over the security of their e-mails and falling victim to hackers. Previous studies have similarly noted this fear among older adults in their use of technology devices and services (Mendel, 2019). Supporting this finding, Wong et al. (2018) reported that Malaysian older adults were afraid of exploring the use of smartphones for mobile banking because they were afraid that their money could be stolen. Frik et al.'s (2019) study among older adults in an urban/suburban area in San Francisco USA also reported similar concerns over privacy and security in the use of technology systems. Hence, for these non-users in the current study, a lack of interest in e-mail or their turning to alternatives may be a result of the underlying fear about the use of technology which may have been due to a lack of information or misinformation about the benefits and risks of using technology.

Conclusion and Recommendations

The study concluded that educated older adults in the urban area were more aware of e-mail than those in the semi-urban and rural areas. There was a lower level of usage of e-mail by older adults in semi-urban and rural dwellers. Most of the users had the intention to continue using e-mail, while most of the non-users also had the intention to use e-mail in the future. Older adults are less likely to adopt new technology unless they see the benefits. Hence, it is recommended that efforts be geared towards creating more awareness by the Nigerian government, health workers, caregivers, and ICT developers about the importance of e-mail among the older population, as well as providing support towards the training of older adults on the use of e-mail, especially among the semi-urban and rural dwellers. Understanding older adults' perceptions of e-mail is important to assist with introducing it to this population and maximising the potential of e-mail in contributing to the adults' connectedness, social networking, and well-being.

Limitations of the Study

The lack of similar studies limited the scope of discussion and comparison of findings. Also, the generalisation is limited due to the small sample size and scope of coverage. Future studies should focus on extending the research to other states in Nigeria. This investigation, however, suggested that the use of email be promoted among educated older adults, especially those in rural communities.

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