COMPARATIVE ANALYSIS OF INFORMATION AND COMMUNICATION TECHNOLOGY CAPABILITY OF MALE AND FEMALE EXTENSION AGENTS IN DELTA STATE, NIGERIA

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Abstract

The study assessed the Information and Communication Technology capability of male and female extension agents in Delta state, Nigeria, in light of the increasing significance of ICT in extension service delivery. The study adopted a purposive sampling to collect data from 96 extension agents (52 males and 44 females) utilising a structured questionnaire and an interview schedule. The data were analysed using frequency, percentages, mean, and t-test at p = 0.05. Results indicated that extension agents were aware of ICT tools assessed, with a strong proficiency in the use of mobile phones (\overline{x} =3.85), text messaging (\overline{x} =3.75) and WhatsApp (\overline{x} =3.20). They showed little or no capability in internet browsing $(\overline{x} 1.65)$, use of the Google search engine (\overline{x} =1.15), video-enabled extension (\overline{x} = 2.45) and data processing ($\overline{x} = 1.65$). There was no significant difference in the ICT capability of male and female extension agents at 0.05 level of significance.To further enhance ICT capability of extension agents, the study recommended adequate and up-to-date training and capacity building to be a regular part of the extension service programme in the State.

Keywords: Comparative, Information and Communication Technology, Capability, Extension Agents

Introduction

Information and Communication Technology (ICT) has revolutionised the world of work and brings to the fore the concept of globalisation and the urgent need for food security and an effective system for agricultural mobilising efforts to enhance deliverables. In this vein, Sennuga (2019), asserted that the use of ICT potentially allows extension workers to contact more farmers with appropriate and up-to-date information in a timely manner. Though, ICT has many functional definitions, Samadder and Deepak (2023),defined Information and Communication Technologies (ICTs) as a set of tools, software, networking components and systems that enable people, institutions and organisations to effectively interact virtually. They further posited that ICT allow the production, processing, storage, transfer, dissemination and exchange of information electronically. Extension service as an organized informal approach to educating, inspiring and influencing rural people to changes in skill, knowledge and attitude has been identified as a critical element of rural transformation, food security and agricultural development with the ultimate aim of increasing farmers' productivity and income (Ismail and Yusuf 2022).

Typically, extension service aims to assist people to discover and analyse their problems and identify their felt needs in addition to disseminating research information in an understandable manner (Jibowo, Ajayi and Adereti 2022). Urhibo (2021) indicated that the Research-Extension Farmer-Input Linkage System (REFILS) in Nigeria provides a strong platform for information sharing that can improve agricultural productivity. He however, identified serious institutional and operational constraints that can hinder the effectiveness and impact of the link. Consequently, an effective linkage supported by a strong information flow system enhanced by the effective use of ICTs by the extension service will significantly improve agricultural productivity and enhance rural livelihood.

Besides that ICTs play a prominent role in the agricultural value chain improvement (Nwobodo, Agwu, Okoronkwo and Innih, 2023), it is opined that it can also strengthen farmers' participation and engagement by providing them with opportunities for knowledge and experience sharing and very importantly, provision of feedback on agricultural extension programmes and activities (Pallavi, Santosh and Ashoka, 2023). In the same vein, Adesida, Nkomoki, Bavorova and Madaki, (2021) asserted that the use of ICT tools such as mobile phones can lead to increased adoption of improved practices in agriculture and enhance quick access and dissemination of information to farmers. Similarly,

Sennuga et al., 2020 stated that ICTs have the potential to improve rural areas with enormous potential of reaching millions of people, breaking geographical barriers, providing regular and recurring interaction, capturing the actuality of an event, storing, sending and receiving data. There is need therefore for extension service to be aligned with the current technological trend because ICT has not only been critical to agricultural development, but has also helped in optimizing yield of crops and reduce considerably thereby input cost increasing productivity and profitability (Gouroubera, Idrissou, Moumouni, Okry and Baco, 2023). Thus, any agricultural extension service that will be effective and result- oriented must have an effective system of knowledge sharing and dissemination and a strong communication channel that is timely and responsive. Commonly identified ICT tools that can enhance the services of extension include smartphones, FM radios, Internet call centre, Television, Multimedia CDs, Computer and Google search engine (Samadder and Deepak, 2023) in addition to other tools that can enhance processing of information, storage, retrieval and transmission. These technological tools are enablers of agriculture and effective extension service delivery. In other words, the human element in ensuring efficient extension service remains pivotal in the achievement of the goals of extension. Furthermore, the use of ICT can also improve connectivity among researchers, farmers' and extension workers ensuring that information and knowledge are seamlessly shared (Samadder and Deepak, 2023), therefore extension professionals should be familiar and skilful with various emerging ICT concepts, tools and trends. The ability to use ICT tools effectively will enhance knowledge sharing and improve number of farmers that can be reached within a period of time. However, reviewed literatures and research work did not clearly indicate if the current male and female extension professionals in Delta State are capable of using ICTs for agricultural extension service delivery. In the light of this and considering the importance of ICT capability by extension agent, it becomes imperative to analyse the ICT capabilities of male and female extension agents in Delta State. The specific objectives were to examine the level of awareness of some ICT tools; identify the ICT tools used among the extension agents; and, determine the ICT tools capability of male and female extension agents.

Hypothesis

H0₁: There is no significant difference between the ICT capability of male and female extension agents

Methodology

The study was conducted in Delta State, Nigeria, located between latitude $5^{0}00'$ and $6^{0}30'$ North and longitude $5^{0}00'$ and $6^{0}45'$ East with an average rainfall of 2000mm per annum, temperature range of 30.4° C - 36.4° C and relative humidity of 56% - 86% annually

(Delta State Government, 2022). The State has two agroecological zones - upland and riverine and is divided into three (3) senatorial districts consisting of twenty-five (25) Local Government Areas (LGAs). The block and cell structure of the Delta State Agricultural and Rural Development Agency (DARDA) was used for the study. The study population consists of all extension agents in the 25 blocks. Each block is made up of 8 cells and each cell is manned by an extension agent. However, only 105 extension agents were active out of which 101 were purposively selected because there were readily accessible and only 96 (52 males & 44 females) returned their questionnaire. Primary data were structured collected using а questionnaire administered to the extension agents.The questionnaire covered information on ICT tools awareness and usage and capabilities in the use of ICT tools. The data collected for the study were analyzed using percentages and means while t - test was used to determine the difference between the ICT capability of male and female extension agents. Respondents' levels of awareness of ICT tools were measured using "yes" and "no" variables while use of ICT was measured on a 4 - point Likert- type scale of regularly (4), sometimes (3), not regular(2) and not at all (1). The variables with a mean of 2.5 and above where considered regularly used. Similarly, respondents' levels of ICT tools capability were measured on a 4 point Likert-type scale of very capable (4), capable (3), little capable (2) and not capable (1). The variables with mean scores of 2.5 and above indicate capability.

Results and Discussion Awareness of Information and Communication Technology tools by Extension Agents

Result in Table 1 shows that the entire respondents' were aware of mobile phones, radio, television, Internet, text messages, video-enabled learning, Whatsapp and Email as ICT tools for extension service delivery. The level of awareness is important as it influences the level of utilisation and capability. Video-enabled learning, which is a recent strategy to integrate ICT in extension and achieve outreach to many farmers with the same extension messaging became popular among respondents through the efforts and collaboration of USAID organised training for extension agents on the use and importance of video learning (FMAFS & USAID, 2023). The implication is that developing capability in the use of video learning will further enhance extension service delivery in the State. E-learning (male=71.2% and female= 63.6%) recorded a high level of awareness in addition to teleconferencing (male=94.2% and female=90.9%) and Facebook (male=96.2% and female=81.8%). It was also observed that 69.2% of males and 36.4% of females were aware of data processing as ICT tool for extension service delivery. The level of awareness for youtube was moderate respondents (male=55.8%) among the and

use of modern ICT tools to enhance their service

delivery. However, the overall levels of awareness is

high and this important for extension service as a high

level of awareness is important for capability building.

female=40.9%). The result also shows that extension agents were more familiar with conventional ICT tools as compared to modern and more contemporary ICT tools. Akintunde and Oladele (2019), asserted that extension agents have not taken full advantage of the

 Table 1: Respondents awareness of ICT tools

ICT tool	Aware (%)			
	Male (n=52)	Female (n=44)		
Mobile Phone	100	100		
Radio	100	100		
Television	100	100		
Internet/Browsing	100	100		
Text Messages	100	100		
E-Mail	100	100		
Goggle search engine	75.0	59.1		
E-Learning	71.2	63.6		
Data Processing	69.2	36.4		
Video-enabled Learning	100	100		
Tele conferencing	94.2	90.9		
Facebook	96.2	81.8		
WhatsApp	100	100		
Youtube	55.8	40.9		

Source: Field data, 2024

Extension Agents' ICT Usage

Table 2 represents the respondents' ICT usage. Repondents indicated a regular usage of mobile phone (male $\overline{x} = 3.4$, female $\overline{x} = 3.7$), radio (male $\overline{x} = 3.0$, female $\overline{x} = 2.7$), text messaging (male $\overline{x} = 3.8$, female $\overline{x} = 3.8$), WhatsApp (male $\overline{x} = 3.4$, female $\overline{x} = 3.6$) and Internet browsing (male $\overline{x} = 2.6$, female $\overline{x} = 3.0$). The finding was in line with research work by Othman *et al.* (2020) that major ICT tools used by extension workers include mobile phones and radio. Other ICT tools such as video-enabled learning (male $\overline{x} = 2.1$, female $\overline{x} = 2.0$), use of goggle search engine (male $\overline{x} =$ 1.9, female $\overline{x} = 2.0$), youtube (male $\overline{x} = 1.0$, female \overline{x} =1.0) and facebook (male $\overline{x} = 1.0$, female $\overline{x} = 1.2$) were sometimes or not regularly used. Ebisike *et al.* (2021) in their study of ICT use among Village extension workers posited that few village extension workers used video conferencing, zoom, internet and e-farming apps for accessing and dissemination of farming information. Strengthening the capabilities of extension agents in the use of these ICT tools will tremendously improve extension service delivery because an excellent ICT extension service delivery system will assist in reaching numerous farmers and breaking geographical barriers (Nyarko and Kozari, 2020).

 Table 2: Extension agents ICT usage

ICT Tool	Male	SD	Femal	e SD	Pooled	SD
	(\overline{x})		(\overline{x})		Mean	
Mobile Phone	3.4	1.24	3.7	1.33	3.55	1.23
Radio	3.0	1.13	2.7	1.22	2.85	1.23
Television	1.3	1.13	1.0	1.14	1.15	1.11
Internet/Browsing	2.6	1.56	3.0	1.23	2.80	1.42
Text Messages	3.8	1.12	3.8	1.18	3.80	1.09
E-Mail	2.7	1.17	1.5	1.15	2.10	1.26
Goggle Search Engine	1.9	1.43	2.0	1.21	1.95	1.33
E-Learning	2.9	1.22	2.3	1.26	2.60	1.21
Data Processing	2.0	1.18	2.1	0.87	2.05	1.19
Video Enabled Learning	2.1	1.41	2.0	1.23	2.05	1.06
Facebook	1.0	1.17	1.2	1.11	1.10	1.14
Whatsapp	3.4	1.23	3.6	1.42	3.50	1.32
Youtube	1.0	1.21	1.0	1.21	1.00	1.23

Source: Field data, 2024.

Extension Agents' ICT Capability

Results from Table 3 shows respondents capability in the use of mobile phones (male $\overline{x} = 3.8$, female $\overline{x} = 3.9$), radio (male $\overline{x} = 2.6$, female $\overline{x} = 2.7$) and email (male $\overline{x} = 2.9$, female $\overline{x} = 3.0$). Others are text messaging (male $\overline{x} = 3.6$, female $\overline{x} = 3.8$), Whatsapp (male $\overline{x} = 3.4$, female $\overline{x} = 3.6$) and E - Learning (male $\overline{x} = 2.6$, female $\overline{x} = 2.8$). Extension agents capability in the use of radio, mobile phones, whatsapp and text messaging is expected because they are the traditional ICT tools available in most work environment and used daily for personal activities. They however showed little or no capability in television (male \overline{x} =2.6, female \overline{x} =2.3), goggle search engine (male \overline{x} = 1.2, female \overline{x} =1.0), data processing (male \overline{x} = 2.2, female \overline{x} = 1.0), facebook (male \overline{x} = 1.70, female \overline{x} = 1.6) and youtube (male \overline{x} = 1.0, female \overline{x} = 2.4). The result indicates that extension agents are capable of using some of the presented ICT tools suggesting that if given the needed training or exposure, they will be very capable in the use of several ICT tools.

Table 3: Respondents ICT capability

ICT Tool	Male	SD	Female SD		Pooled SD
	(\overline{x})		(\overline{x})		Mean
Mobile Phone	3.8	1.23	3.9	0.97	3.85 1.12
Radio	2.6	1.26	2.7	1.22	2.65 1.24
Television	2.6	1.18	2.3	1.34	2.45 1.11
Internet/Browsing	1.9	1.12	1.4	1.22	1.65 1.18
Text Messages	3.6	0.99	3.8	1.35	3.75 1.14
E-Mail	2.9	1.45	3.0	1.21	2.95 1.34
Goggle Search Engine	1.2	1.44	1.0	1.17	1.15 1.08
E-Learning	2.6	1.23	2.8	1.66	2.75 1.34
Data Processing	2.2	1.35	1.1	1.26	1.65 1.22
Video Enabled Learning	2.6	1.29	2.3	1.32	2.45 1.30
Facebook	1.7	0.95	1.6	1.11	1.65 1.60
Whatsapp	3.0	1.01	3.4	1.13	3.20 1.08
You-Tube	1.0	1.21	2.4	1.33	1.70 1.23

Source: Field data, 2024.

Difference in ICT Capability of Male and Female Extension Agents

The result reveals that there was no significant (t = 2.1) difference among male and female extension agents

capability in the use of ICT even though Idowu *et al.*, (2021) reported that there was a marginally significant difference between male and female extension workers proficiency and use of ICT tools.

 Table 5: Test of Difference in ICT Capability of Male and Female Extension

 Agents

Variable	Ν	df	Mean	Difference	t
Male	52		1.89		
Female	44	95	1.79	0.10	2.1*
Source: Field data, 2024.	$p \le 0.05$				

Conclusion and Recommendations

The male and female extension agents in Delta State are aware of and utilise ICT tools. However, their capability in utilisation was restricted to a few ICT tools which they may have been exposed. Specialised training programmes be organised to strengthen the capability of both male and female extension agents to use modern ICT tools.

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