RESEARCH ARTICLE

EXTENSION PERSONNEL'S KNOWLEDGE ABOUT INFORMATION AND COMMUNICATION TECHNOLOGY

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Received-03.08.2020, Revised-31.08.2020

Abstract: Information and Communication Technologies are emerging as important tools for agricultural extension and it is now essential for every extension worker to have working knowledge of ICT tools and devices like computers, internet, mobile phone, kisan call center, information kiosks, e-mails, expert systems, touch screen systems, and World Wide Web. The present study was conducted in Udaipur district of Rajasthan. The state department of agriculture extension was purposively selected as a government organisation and eight NGOs working in agriculture with more use of ICTs were also selected from Udaipur district. To select a sample of respondents from the GO, 80 extension personnel were selected on the basis of random sampling technique. Likewise, 80 extension personnel from selected NGOs were taken on the basis of proportionate random sampling. Consequently, a total of 160 respondents (80 from GO & 80 from NGOs) were included in the sample of study. For the purpose of study five commonly used ICT tools namely computer, internet, mobile phone, kisan call centers and information kiosks were selected. It was noted that overall knowledge of respondents about computer, internet, mobile phone, kisan call center and information kiosk was 61.16, 57.22, 75.50, 58.45, and 45.82 per cent respectively. The knowledge of NGOs personnel was significantly higher than GO personnel about ICT tools.

Keywords: ICT, Extension personnel, Agriculture, Knowledge, GO and NGO

INTRODUCTION

Majority of population in India lives in rural areas and they have no or limited access to scientific agricultural information. Dissemination of agricultural information among the farming community needs to be strengthened and modernized. Modern information and communication technology (ICT) can modernize our agriculture information system. During last three decades, an unprecedented growth in area of ICT has been reported. ICT helps people to communicate effectively, overcome the limitations of temporal and spatial hassels, empower people by providing information and knowledge, provide income generating and learning opportunities, increase government transparency and efficiency and enable people to express their concerns and to actively participate in decision making processes (Asian Development Bank, 2004). Thus for agriculture and rural development, ICT can play an important role for improving the quality life of farmers. However, the potential of ICT has yet to be realized in India due to the lack of connectivity and accessibility of online agricultural services among farming communities.

The extension personnel of government and non-government organizations have responsibility to disseminate improved agricultural technologiesamongthe farming community. Nowadays extension personnel are using various ICTs for effective discharging their duties and disseminating agriculture technologies among the farmers. But their efficiency and effectiveness in using ICT tools and technologies is also cause of concern. The major reason behind poor efficiency of extension personnel may be lack of knowledge about ICT tools and techniques. Therefore, it is necessary to investigate present status of ICT knowledge among extension personnel. This would enable the policy makers to make effective ICT strategy for agriculture and rural development.Keeping this vision in mind, an effort has been made to study the knowledge level of extension personnel about ICTs tools and techniques.

RESEARCH METHODOLOGY

The present study was conducted in Udaipur district of Rajasthan. The state department of agriculture extension was purposively selected for the study as a government organization (GO) and eight non-government organizations (NGO) working in agriculture and using ICTs for technology dissemination were also selected from Udaipur district. To select a sample of respondents from the GO, 80 extension personnel were selected on the basis of random sampling technique. Likewise, from eight selected NGOs, 80 extension personnel were taken on the basis of proportionate sampling procedure. Consequently, a total of 160 respondents (80 from GO & 80 from NGOs) were included in the sample of study. For the purpose of study five commonly used ICT tools namely computer, internet, mobile phone, kishan call centers and information kiosks were selected. The data were collected through developed instrument; thereafter the data were analyzed, tabulated and interpreted.

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Measurement of knowledge

To measure the knowledge level of extension personnel about ICTs, a knowledge schedule was developed. Total five major tools of ICT were included in the schedule *viz.* computer, internet, mobile phone, kisan call center, and information kiosks. Tool wise several questions were developed to explore the existing knowledge of respondents. One score was assigned to each correct answer and wrong answer was given zero score. Therefore, possible maximum score a respondent could obtain was 157. To find out the level of knowledge, overall score for each respondent was calculated and respondents were categorized into three groups on the basis of overall score obtained by each respondent.

1.Low level of knowledge =$[\overline{X} - S.D.]$

2.Medium level of knowledge

=$[\overline{X} - S.D.\ to\ \overline{X} + S.D.]$

3.High level of knowledge=$[\overline{X} + S.D.]$

Frequency and percentage of respondents in each category i.e. low, medium and high was calculated. The knowledge index for each respondent was calculated by using the following formula:

$$KI = \frac{K}{P} x100$$

Where,KI = Knowledge index

K = Knowledge score obtained

P = Maximum obtainable score

To determine the extent of knowledge of respondents about each aspect of major ICT tools mean per cent score was worked out and ranked accordingly. Spearman's rank correlation (r_s) was applied to determine the relationship between the ranks assigned by the two categories of respondents. To find out the significance of difference in knowledge between extension personnel of GO and NGOs, 'Z' test was applied.

RESULTS AND DISCUSSION

In the present study, the term knowledge was defined as a body of information possessed by an individual, is the one of important component of adoption behaviour, it has even been considered by many extension scientists as prerequisite for adoption. In order to increase the level of access to new ICTs among the respondents, it is imperative to examine the existing level of knowledge of extension personnel about ICTs.The results are presented in subsequent tables.

Distribution of respondents on the basis of their level of knowledge about ICT:

To get an overview of knowledge status about ICTs among the respondents they were classified into three categories *i.e.* low, medium and high knowledge level on the basis of calculated mean and standard deviation of the knowledge scores obtained by the respondents.

Table 1. Distribution of respondents on the basis of their knowledge aboutICT n=160

S. No.	Knowledge level	GO Personnel		NGOs Personnel		Total	
		f	%	f	%	f	%
1.	Low (below 76.04)	28	35.00	05	6.25	33	20.62
2.	Medium (76.05 to 116.18)	46	57.50	69	86.25	115	71.88
3.	High (above 116.18)	06	7.50	06	7.50	12	7.50
	Total	**80**	**100.00**	**80**	**100.00**	**160**	**100.00**

f = Frequency, % = per cent

A perusal of data in Table 01clearly presents the fact that a majority of the total respondents (71.88%) had medium level of knowledge about ICTs whereas, 20.65 per cent respondents were observed in low level of knowledge group. It was further noted that only 7.50 per cent of the total respondents had high level of knowledge regarding ICTs in the study area.

The analyzed data contained in a Table 01 further indicate that 57.50 per cent respondents of GO and 86.25 per cent of NGOs respondents had medium level of knowledge about ICTs. The difference between the GO and NGOs respondents fell under medium level knowledge group which indicates that knowledge level of NGOs personnel was higher than the knowledge level of GO personnel; on the other hand 35.00 per cent of GO respondents and only 6.25 per cent of NGOs respondents belonged to low knowledge group. A considerable number of GO respondents in this group clearly show that they have low level of knowledge about ICTs.

However, an equal number of respondents from both GO and NGOs *i.e.* 7.50 per cent were reported in the high level of knowledge regarding ICTs. Thus, it can be concluded from the table that majority of GO and

NGOs personnel had medium level of knowledge about ICT. It was further inferred that the existing knowledge of NGOs personnel about ICTs was comparatively higher then GO personnel. The results of the study are similar to the results of Verma*et al.* (2009) who concluded that majority of cellphone users and non-users possessed medium level of knowledge whereas, more than 40 per cent mobile users and only 5.33 per cent non-users were reported to have high level of knowledge about scientific crop management practices.

ICT tool wise extent of knowledge among extension personnel:

ICT tools identified for the present study were - computer, internet, mobile phone, kishan call center, and information kiosk. Therefore, an effort was made to find out the tool wise extent of knowledge among the respondents. The results of the same have been presented in the subsequent tables.

Knowledge of extension personnelabout computer:

Computer is an advanced electronic device that takes raw data as input from the users and processes these data under the control of set of instructions (called progamme) and gives the result (output) and saves output for the further use. It can process both numerical and non-numerical (arithmetic and logical) calculations.Over the past three decades computers have played an important role in the area of research, education and management; with the decreasing cost of computer hardware it has become possible to utilize computer technology in agriculture also.

Data presented in Table 02 show that both GO and NGOs personnel possessed maximum knowledge about meaning of computer of (98.75 and 100.00 per cent respectively) and this aspect was ranked first by both the categories of respondents. In the case of the extent of knowledge about personal computer, it was noted that the knowledge level of personnel of GO and NGOs was 67.50 and 98.75 per cent respectively. It was ranked seventh by GO personnel and second by NGOs personnel.

Further analysis of the Table reveals that extent of knowledge about advantages of computer, name of important manufacturer companies of computer, approximate cost of computer, major parts of computer, brain of the computer, input devices of computer and nature of printer as device was observed to be 69.58, 58.12, 96.25, 73.12, 65.00, 46.87 and 63.75 MPS among the extension personnel of government organization respectively. In case of extension personnel of NGOs the extent of knowledge about these aspects was 80.93, 75.94, 96.50, 87.18, 90.00, 65.94 and 85.00 MPS respectively.

In the case of knowledge about important hardware of the computer it was found that extension personnel of GO and NGOs had knowledge 51.25 and 60.31 per cent respectively. The knowledge of respondents of GO and NGOs about the software commonly used for computer application was 30.93 and 63.75 per cent respectively. Majority of the respondents of GO did not know about software such as adobe Photoshop, coral draw, and tally which are used for computer application in agriculture.

Table 2. Knowledge of extension personnelabout computer n=160

S. No.	Aspects	GO Personnel		NGOs Personnel		Total	
		MPS	Rank	MPS	Rank	MPS	Rank
1.	Meaning of computer	98.75	1	100.00	1	99.37	1
2.	Acquaintance with personal computer	67.50	7	98.75	2	83.12	4
3.	Advantages of computer	69.68	6	80.93	10	75.30	8
4.	Name of important manufacturer companies of computer	58.12	10	75.94	12	67.03	10
5.	Approximate cost of computer	96.25	3	96.50	4	96.37	3
6.	Major parts of the computer/ laptop	73.12	4	87.18	6	80.15	5
7.	Brain of the computer	65.00	8	90.00	5	77.50	6
8.	Input devices of computer	46.87	13	65.94	14	56.40	13
9.	Nature of printer as device	63.75	9	85.00	7	74.37	9
10.	Important hardware of the computer	51.25	11	60.31	19	55.78	14
11.	Software commonly used for computer application	30.93	17	63.75	18	47.34	18

12.	Latest version of operating system	17.50	20	65.00	15	41.25	20
13.	Function of RAM in computer	37.50	14	60.00	20	48.75	16
14.	Role of ROM in computer	11.25	21	45.00	21	28.12	21
15.	Name of storage devices of computer	49.68	12	64.68	16	57.18	11
16.	Use of 'save as' option in computer	27.50	18	81.25	9	54.37	15
17.	Use of various shortcut keys of computer	32.50	16	64.06	17	48.28	17
18.	Use of 'sort' option in computer	7.50	22	43.75	22	25.62	22
19.	Knowledge about creating new folder	70.00	5	83.75	8	76.87	7
20.	Closing of files, documents and programmes	98.50	2	98.50	3	98.50	2
21.	Commonly used font for English typing	33.75	15	80.00	11	56.87	12
22.	Byte in computer	22.50	19	68.75	13	45.62	19

MPS = Mean per cent score

Table further indicates that extension personnel of NGOs possessed better knowledge (65%) about latest version of operating system of computer, while respondents of government organizations had poor knowledge (17.50 %) about this aspect. The poor knowledge of the respondents of GO may be due to the fact that computers are not readily available in the office as well as at home. The knowledge about function of RAM and ROM in computer was 37.50 and 11.25 per cent in GO personnel, while NGOs personnel it was 60.00 and 45.00 per cent respectively. The extent of knowledge about names of storage devices of computer was ranked twelfth and sixteenth by respondents of GO and NGOs with 49.68 and 64.68 per cent respectively.

The extent of knowledge about use of 'save as' option in computer, use of various shortcut keys, creating new folder, commonly used font type for English typing, and byte in computer was 27.50, 32.50, 70.00, 33.75 and 22.50 per cent in respondents of government organization respectively. In case of respondents of NGOs, the extent of knowledge about these aspects was 81.25, 64.06, 87.75, 80.00, and 68.75 per cent respectively. The knowledge about sort option in computer was 7.50 and 43.75 per cent among extension personnel of GO and NGOs respectively and this aspect was ranked last in knowledge hierarchy by both the categories of respondents.

Thus, from the above discussion it can be concluded that the extent of knowledge in respondents of GO was from 7.50 to 98.75 per cent whereas, in case of respondents of NGOs the extent of knowledge was observed to be 43.75 to 100.00 per cent in all aspects of computer. Further it was inferred that extension personnel of NGOs possessed more knowledge than extension personnel of GO about almost all the aspects of computer technology.

The findings of the study are in agreement with the findings of Ndag et al. (2008) who concluded that the proportion of respondents who did not have knowledge of computer use was slightly higher in the North-central (57.14%) than in the South-west Nigeria (55.71 %).

Knowledge of extension personnelabout internet technology:

The internet is a global system of interconnected computer networks that use the standard internet protocol suite (often called TCP/IP) to serve billions of users worldwide. It is a network of networks that consists of millions of private, public, academic, business and government networks of local to global scope, that are linked by a broad array of electronic, wireless and optical networking technologies. The internet carries an extensive range of information resources and services, such as the interlinked hypertext, documents of the world wide web (www) and the infrastructure to support e-mails. Internet is being widely used in India. Most of the government, private offices and individuals have internet connectivity. Therefore, a conscious effort has been made to test the knowledge level of agriculture extension personnel about internet technology. To find out the knowledge level of extension personnel about internet, 14 questions which can measure the knowledge were prepared and used. To calculate the knowledge MPS for each question was calculated and ranks were assigned accordingly. The results are presented in the Table 03.

Table 3. Knowledge of extension personnel regarding internet technology n=160

S. No.	Aspects	GO Personnel		NGOs Personnel		Total	
		MPS	Rank	MPS	Rank	MPS	Rank
1.	Meaning of internet	88.75	1	100.00	1	94.37	1
2.	Major internet service providers	74.06	2	78.12	6	76.09	3
3.	Advantages of internet	59.37	5	68.44	8	63.90	6
4.	Meaning of www	50.00	7	82.50	4	66.25	5
5.	High speed internet services	61.25	4	86.25	3	73.75	4
6.	Meaning of Wi-Fi	35.00	11	67.50	10	51.25	11
7.	Familiarity with data card	57.50	6	65.00	11	61.25	7
8.	Devices used for conferencing through internet	37.50	10	78.75	5	58.12	8
9.	Common uses of internet	41.56	9	62.81	12	52.18	10
10.	Meaning of e-mail ID	70.00	3	88.75	2	79.37	2
11.	Major search engines for searching desired information	43.75	8	68.34	9	56.04	9
12.	Important websites for getting agriculture information	19.75	13	43.00	14	31.37	13
13.	Knowledge about LAN	30.00	12	70.00	7	50.00	12
14.	Acquaintance with WAN	8.75	14	48.75	13	28.75	14

MPS = Mean per cent score

A perusal of data presented in Table 03 reveals that the extent of knowledge about meaning of internet among extension personnel of GO and NGOs was 88.75 and 100 per cent respectively. This aspect was ranked first by both the categories of respondents. Further, it was reported that majority of respondents were acquainted with e-mail ID. Out of total 160 respondents, 70 per cent GO personnel and 88.75 per cent NGOs personnel responded that e-mail ID is a personal account on internet for sending and receiving electronic mails and this aspect was ranked second by NGOs respondents and third by GO respondents.

The extent of knowledge about popular internet service providers (like BSNL, Airtel, Reliance and TATA Telecom) was 74.06 and 78.12 per cent among GO and NGOs personnel respectively. The knowledge level about high speed internet services (Broadband & 3G, 4G) was recorded to be 61.25 and 86.25 MPS in extension personnel of GO and NGOs respectively. This aspect was ranked fourth by GO respondents and third by NGOs respondents. Likewise, the extent of knowledge regarding www (world wide web) was 50.00 in GO respondents and 82.50 per cent in NGOs respondents.

The knowledge level of GO and NGOs respondents about advantages of internet was 59.37 and 68.49 per cent respectively. This aspect was ranked fifth by GO personnel and eighth by NGOs personnel. It was observed that respondents were aware that internet can reduce communication cost, accelerate information sharing and provide quick access to agricultural information.

Further analysis of table shows that 57.50 per cent respondents of GO and NGOs had knowledge about the device used for accessing internet *i.e.* data card (Dongle). This aspect was ranked sixth by GO respondents and eleventh by NGOs respondents. The level of knowledge about devices used for internet conferencing was found 37.50 per cent in case of GO respondents. On the other hand NGOs respondents had 78.75 per cent knowledge about webcam and head phone which is required for internet conferencing. This wide knowledge gap between GO and NGOs extension personnel may be due to the reason that majority of NGOs extension personnel use laptop computer which has inbuilt webcam and head phone is mostly used for listening to music by them.

It was also noted that the knowledge level about major search engines among GO and NGOs respondents was 42.75 and 68.34 per cent respectively. It is a matter of concern that only 41.56 per cent of GO respondents and 62.81 per cent of NGOs respondents knew common uses of internet. This aspect was ranked ninth by the GO respondents and twelfth by NGOs respondents.

Further analysis of data exhibits that the extent of knowledge about Wi-Fi technology was 35.00 and 67.50 per cent among GO and NGOs respondents respectively. It means that majority of extension personnel of NGOs knew the technology which automatically connects the internet in the defined locality.

It is disappointing to observe that extent of knowledge about the important websites for getting agricultural information was poor in extension personnel of GO and NGOs (19.75 and 43 per cent respectively). Similarly the knowledge about Wide Area Network (WAN) was found 8.75 and 48.75 per cent among GO and NGOs personnel respectively.

Consequently this aspect was ranked last by GO and second last by NGOs personnel.

Thus, from the above discussion it may be concluded that the extent of knowledge among GO respondents was 8.75 to 88.75 per cent whereas, in case of NGOrespondents' extent of knowledge was observed to be from 43.00 to 100 per cent in all the aspects of internet technology. Further, it was inferred that NGOs personnel had comparatively more knowledge than GO personnel about various aspects of internet. The present findings are supported by the findings of Adebayo (2007) and Mathews *et al.* (2007).

Knowledge of extension personnelabout mobile phone:

A mobile phone often referred to as a cellular phone or cell phone is an electronic telecommunication device that can make and receive telephone calls through radio wave or satellite transmission whilst moving around a wide geographic area. Most mobile phones provide voice communications, Short Message Service (SMS), Multimedia Message Service (MMS), short range wireless communication (Infrared, Bluetooth), business applications, gaming, photography and internet services such as web browsing and e-mail. Mobile communication technology has become the world's most common way of transmitting voice, data and services, and no other technology has ever spread so fast. The mobile phone is especially important for India because it is growing here faster. To assess the knowledge level of extension personnel 15 questions related to mobile phone technology were made. To calculate the level of knowledge mean percent score for each aspect was calculated and ranks were assigned. The results of the study have been presented in Table 04.

Table 4. Knowledge of extension personnelabout mobile phone n=160

S. No.	Aspects	GO Personnel		NGOs Personnel		Total	
		MPS	Rank	MPS	Rank	MPS	Rank
1.	Acquaintance with mobile phone	100.00	1	100.00	1	100.00	1
2.	Major manufacturer companies of cell phone	77.18	6	86.56	4	81.87	5
3.	Different types of cell phones	49.68	13	64.68	14	57.18	14
4.	Acquaintance with sim card	98.50	2	99.00	2	98.75	2
5.	Basic requirements to buy a sim card	75.94	8	75.00	9	75.47	8
6.	Understanding about memory card	87.50	3	92.50	3	90.00	3
7.	Advantages of mobile phone	78.75	5	80.94	8	79.84	6
8.	Name of mobile phone service providers	87.18	4	86.25	5	86.87	4
9.	Type of mobile phone compatible for internet browsing	68.75	11	68.75	12	68.75	10
10.	Uses of mobile phone	74.68	9	81.25	7	77.96	7
11.	Meaning of GPRS service	27.50	15	66.25	13	46.87	15
12.	Type of agriculture information accessed through cell phone	76.25	7	70.83	11	73.54	9
13.	Knowledge about Bluetooth service	55.00	12	71.25	10	63.12	12
14.	Familiarity with IKSL	70.00	10	53.75	15	61.87	13
15.	Knowledge of 3-G service	48.75	14	85.00	6	66.87	11

MPS = Mean per cent score

Table 04 reveals that centpercent field personnel of GO and NGOs were acquainted with mobile phone and it was ranked first by both the categories of the respondents. This may be due to the fact that almost all the extension personnel had mobile phone or cell phone. In the case of the extent of knowledge about major manufacturer companies of cell phone it was noted that GO and NGOs personnel had knowledge level of 77.18 and 86.56 per cent respectively. Majority of extension personnel knew that NOKIA, SAMSUNG, LG, SONY *etc.* are the important manufacturers of mobile phone.

The extent of knowledge about different types of cell phones, simcard, basic requirement to buy a simcard, memory card, advantages of mobile phone and names of mobile phone service providers was observed to be 49.68, 98.50, 75.94, 87.50, 78.75 and 87.18 per cent among GO personnel respectively. In case of NGO personnel, the extent of knowledge about these aspects was 64.68, 99.00, 75.99, 92.50, 80.94 and 86.25 per cent respectively. Further it was found that respondents of GO and NGOs possessed equal level of knowledge (68.75 MPS) about type of mobile phone compatible for internet browsing and this aspect was ranked eleventh by GO respondents, while NGOs personnel ranked it twelfth.

In the case of the knowledge about uses of mobile phone, it was recorded that respondents of GO and NGOs had knowledge level of 74.68 and 81.25 per cent respectively. Most of the respondents of both the organizations knew that mobile phone can be used for voice communication, SMS and internet browsing for e-mails. It is interesting to note that GO personnel had more knowledge than NGOs personnel about various type of agricultural information can be accessed through mobile phone.

Table 04 also shows that the extent of knowledge about 3-G services was 48.75 MPS among GO respondents whereas; in case of NGOs respondents it was 85 per cent. It indicates that NGOs personnel had more knowledge than GO personnel about 3G service. It may be because of the fact that NGOs personnel prefer to have Hi-Fi multimedia cell phones with high speed internet connection so that internet application can be accessed through mobile phone.

Further analysis of table shows that 55.00 and 71.25 per cent knowledge was possessed by respondents of GO and NGOs respectively about Bluetooth technology i.e. wireless electronic device used for data transfer from cell phone to other devices and vice-versa in a defined circle. This aspect was ranked twelfth by the GO respondents and tenth by NGOs respondents. It was also noted from the data shown in the table 04 that respondents of GO and NGOs had idea about mass messaging service of IKSL (IFFCO Kishan Sanchar Limited) with the extent of 70.00 53.75 per cent respectively.

From the above results it can be concluded that the extent of knowledge of GO respondents was 27.50 to 100.00 per cent, whereas, extent of knowledge of NGOs respondents was reported to be 46.87 to 100.00 per cent in all aspects of mobile phone technology. Further it was inferred from the above discussion that NGOs personnel had greater knowledge than GO personnel with the exception of some aspects of mobile phone technology. The present findings are in accordance with the results of Verma*et al.* (2013) who reported that the extent of knowledge of mobile users was from 64.03 to 88.23 per cent, while in case of non-users it was found 44.76 to 56.05 per cent in all major scientific prop management practices.

Knowledge of extension personnelaboutkishan call center:

With the increasing demand of information related to inputs, pesticides, herbicides, high yielding varieties, a farmer today requires guidance of expert agriculturists more than anything else. Therefore, the Department of Agriculture & Cooperative (DAC), Ministry of Agriculture, Govt. of India took pioneering initiative and launched Kishan Call Center (KCC) on January 21, 2004 across the country to deliver extension services to the farming community.

The kishan call centers are working in most of the state including Rajasthan which are addressing farmers queries related to agriculture and allied sectors. Extension personnel are working for popularizing and monitoring of KCC in their areas. Some of the extension personnel are also providing services on KCC as subject matter specialists to satisfy farmer's queries. Therefore, it is important to know the status of knowledge of extension personnel about KCC. To assess the knowledge of extension personnel about kishan call center, a total number of 12 questions were included in the knowledge test which was closely related with kishan call center. To assess the knowledge, MPS for each aspect was calculated and ranks were given accordingly. The findings of the same have been presented in Table 05.

The data presented in Table 05 indicate that the extent of knowledge about concept of kishan call center among GO and NGOs personnel was 100.00 and 88.00 per cent respectively and this aspect was ranked first by both the categories of respondents. It was also noted that 88.75 and 55.00 per cent knowledge about contact number of KCC *i.e.* 1800 180 1551 was in extension personnel of GO and NGOs respectively. As far as level of their knowledge about timing for calling to kishan call center, is concerned it was noticed to be 68.75 and 50.00 per cent in GO and NGOs personnel respectively.

Table 5. Knowledge of extension personnelaboutkishan call center n=160

S. N.	Aspects	GO Personnel		NGOs Personnel		Total	
		MPS	Rank	MPS	Rank	MPS	Rank
1.	Concept of kishan call center	100.00	1	88.00	1	94.00	1
2.	Contact number of kishan call center	88.75	3	55.00	6	71.87	4
3.	Timings for calling kishan call center	68.75	6	50.00	8	59.37	6
4.	Advantages of kishan call center	78.43	5	61.25	4	69.84	5
5.	Language used by KCC experts to reply farmer's quarry	87.50	4	75.00	2	81.25	2
6.	Mode of service to the farmers by kishan call center	93.75	2	67.50	3	80.62	3
7.	Subjects in which kishan call center provides the information	57.08	8	50.42	7	53.75	8
8.	Nodal office for kishan call center in Rajasthan	38.75	9	45.00	9	41.87	9
9.	Nodal officer of kishan call center in Rajasthan	11.25	11	27.50	10	19.37	11
10.	Toll free number of CFCL agro services 'Hello Uttam'	5.00	12	21.25	12	13.12	12
11.	Toll free number of Mahindra KrishiMitra agro-advisory services	30.00	10	22.50	11	26.25	10
12.	Various levels of kishan call center.	62.08	7	56.25	5	59.16	7

MPS = Mean per cent score

Analysis of the Table further shows that among personnel of GO the extent of knowledge about advantage of kishan call center, language used by KCC expert for farmer queries, mode of service to the farmer by kishan call center, name of the field in which kishan call center provide services, location of the nodal office for KCC in Rajasthan and nodal office of kishan call center was 78.43, 87.50, 93.75, 57.50, 38.75 and 11.25 per cent respectively. While, in case of NGOs personnel the extent of knowledge about these aspects was 61.25, 75.00, 67.50, 50.42, 45.00 and 27.50 per cent respectively.

In case of various levels of kishan call center, the respondents of GO and NGOs had 62.08 and 56.25 per cent knowledge and ranked seventh by GO personnel and fifth by NGOs personnel respectively. The extent of knowledge about toll free number of Mahindra KrishiMitra agro- advisory services, it was noted that extension personnel of GO and NGOs possessed only 30.00 and 22.50 MPS respectively. It means that majority of the extension personnel did not know about the toll free number (1800 425 4085) of Mahindra KrishiMitra agro advisory services. The results clearly show that very few respondents of GO and NGOs had knowledge regarding toll free number of CFCL (Chambal Fertilizer and Chemical Limited) agro service "Hello Uttam" and this aspect was accorded last rank by both the categories of extension personnel.

From the above matrix it can be concluded that extent of knowledge among respondents of GO was 5.00 to 100 MPS while in case of NGOs respondents it was 21.25 to 88.00 MPS about all aspects of kishan call center. The data also inferred that respondents of GO had greater knowledge than NGOs respondents about various aspects of kishan call center. The present results are in line with the results of Hanumankar (2011).

Knowledge of extension personnelabout information kiosks:

In a generalized term information kiosks are the public installations wherein computers are installed to make agriculture extension services accessible to people. Information kiosk is a hub of information as per the need of the area or the best source of information. Any visitor to the kiosks can have access to any kind of information regarding package of practices, plant protection measures, nutritional deficiencies, symptoms of various pests and diseases of several crops and problems he encounters in the field. Even video clippings along with voice can also be viewed and information about technological applications can be listened in local language. In the present study both public and private sector information kiosks like common service center (CSC) and ITC e-chaupal were included. In the area of Rajasthan information kiosks are popularly known as e-mitra. Therefore, a need to assess the status of knowledge about information kiosks among the extension personnel of the study area was felt. To assess the extent of knowledge about information kiosks among extension personnel, 12 questions were framed and included in the knowledge test. The results of the same have been presented in the Table 06.

Table 6: Knowledge of extension personnelabout information kiosks n=160

S. No.	Aspects	GO Personnel		NGOs Personnel		Total	
		MPS	Rank	MPS	Rank	MPS	Rank
1.	Meaning of information kiosks	83.75	1	83.25	1	83.50	1
2.	Working area of e-mitra kiosks	75.00	2	78.75	2	76.87	2
3.	Working area of CSCs	58.75	3	66.25	4	62.50	3
4.	Number of villages covered by one CSC	45.00	8	46.25	8	45.62	7
5.	Type of information available at information kiosks	33.75	9	35.25	10	34.50	9
6.	Designation of operator of CSC at village level	27.50	10	30.00	11	28.75	11
7.	Initiation year of Common Service Centers	17.50	12	20.00	12	18.75	12
8.	Name of the department who established CSCs	46.00	6	41.25	9	43.62	8
9.	Advantages of the information kiosks	45.94	7	49.68	5	47.81	5
10.	Name of Initiator of e-chaupal	47.50	4	72.25	3	59.87	4
11.	Web portal of the e-mitra/ CSC	18.75	11	42.25	7	30.50	10
12.	Services provided by e–chaupal	46.25	5	46.56	6	46.40	6

MPS = Mean per cent score

Table 06 indicates that the extent of knowledge about meaning of information kiosks was 83.75 and 83.25 per cent among the respondents of GO and NGOs respectively. This aspect was ranked first by both the categories of the respondents. The extent of knowledge about working area of e-mitra kiosks was noticed to be 75.00 and 78.75 MPS in GO and NGOs personnel respectively. It means that majority of extension personnel knew that the e-mitrakiosk provides services in the urban areas. Similarly, the knowledge about working area of CSC kiosks was reported to be 58.75 and 66.25 per cent among GO

and NGOs respondents respectively. Most of the respondents were fully aware that CSC kiosks provide services in the rural area. This aspect was ranked third by GO respondents and fourth by the NGOs respondents.

The table further depicts the extent of knowledge regarding number of villages covered by one CSC, it was found that extension personnel of GO and NGOs had knowledge level of 45.00 and 46.25 per cent respectively. It was ranked eighth by both groups of the respondents. In case of type of information available at kiosk, extent of knowledge was noted to be only 33.75 and 35.25 per cent among GO and NGOs personnel respectively.

In the case of knowledge regarding designation of operator of CSC at village level, name of the department who initiated CSC, advantages of the information kiosks, name of initiating company of e-chaupal, web portal of e-mitra/CSC and services provided by e-chaupal the knowledge level was recorded to be 27.50, 46.00, 45.94, 47.50, 18.75 and 46.25 MPS among GO personnel respectively. While in case of NGOs personnel, the extent of knowledge regarding these aspects was 30.00, 41.25, 49.68, 72.25, 42.25 and 46.56 MPS respectively. Regarding knowledge about initiation year of CSC, it was found that 17.50 and 21.00 per cent in GO and NGOs respondents know about it and this aspect was ranked last by both the categories of respondents. It means that majority of extension personnel did not know the year (2006) in which common service center was started in Rajasthan.

From the above discussion, it may be concluded that the extent of knowledge in GO personnel was from 17.50 to 83.75 MPS, while in case of NGOs personnel the extent of knowledge was observed to be from 20.00 to 83.25 MPS about all aspects of information kiosk. Similar results were reported by Sharma (2004).

Overall knowledge of respondents'aboutICT tools:

To find out individual ICT tool wise overall knowledge of GO and NGOs respondents mean per cent score were calculated. The findings about the same have been presented in the Table 07.

Table 07 reveals that GO and NGOs respondents possessed maximum knowledge about mobile phone with mean per cent score 71.71 and 78.80 respectively and it was ranked first by both the categories of respondents. Majority of respondents had complete idea about various aspects of mobile phone *viz.* sim card, memory card, advantages of mobile, major service providers and manufacturers of cell phone. The knowledge about computer technology was placed on second rank by respondents of NGOs while it was placed on third rank by respondents of GO. It was further observed that some of the respondents had full awareness of P.C., closing and opening of files or documents, appropriate cost of computer, major parts of computer, and various storage devices.

Table 7. Overall knowledge of respondents aboutICT tools n=160

S. No.	ICT tools	GO Personnel		NGOs Personnel		Total	
		MPS	Rank	MPS	Rank	MPS	Rank
1.	Computer	51.33	III	72.41	II	63.37	II
2.	internet	48.37	IV	72.01	III	60.19	III
3.	Mobile phone	71.71	I	78.80	I	75.26	I
4.	Kishan call center	60.11	II	51.63	IV	55.87	IV
5.	Information kiosk	45.47	V	50.97	V	48.22	V

MPS = Mean per cent score

Likewise, extent of knowledge of GO and NGOs personnel about kishan call center was 60.11 and 51.63 MPS respectively. Most of the respondents knew advantages of KCC, call timing and contact numbers of KCC. Further table shows that knowledge about internet technology was 48.37 and 72.01 MPS among GO and NGOs respondents. Many of the respondents possessed knowledge of internet e-mail ID, advantages of internet, major internet service provider and meaning of www.

The knowledge about information kiosk of GO and NGOs respondents was recorded 45.47 and 50.97 per cent respectively and ranked last in the ranking order by both the categories of respondents. Some of extension personnel of GO and NGOs had idea about CSC, e-mitra and e-chaupal with their working locality and advantages.

Comparison of knowledge between GO and NGOs extension personnel about ICTs:

In addition to study of knowledge level of GO and NGOs personnel about ICTs, further efforts were made to study the difference between GO and NGOs regarding knowledge of ICTs. To find out the variation in the knowledge of the respondents 'Z' test was applied. The results are presented in Table 08.

Table 8. Comparison between personnel of GO and NGOs about knowledge of ICTs.

S. No.	Category of respondents	Mean	S.D.	'Z' value
1.	GO Personnel	87.55	22.91	5.95**
2.	NGOs Personnel	104.68	11.72	

*** Significant at 1 per cent level*

Table 08 shows that the calculated 'Z' value was found to be greater than its tabulated value at 1 per cent level of significance. Thus, the null hypothesis (NH_{01}) was rejected and alternate hypothesis (RH_1) was accepted. It reveals that there was significant difference in knowledge between GO and NGOs extension personnel about ICT. The mean value further indicates that NGOs personnel had higher knowledge than GO personnel about ICTs. The difference in the level of knowledge of extension workers might be due to the availability of and accessibility to ICT tool in office as well as home of NGOs respondents and also due to the fact that they used these ICT tools. Another reason of high knowledge among NGOs personnel may be their youth; youngsters are techno savvy and have passion to use new ICT tools.

CONCLUSION

In conclusion it can be understood that majority of the respondents had medium level of knowledge about ICTs. A considerable number of GO respondents in low knowledge group clearly show that they have low level of knowledge about ICTs. Further It can be concluded that extension personnel of NGOs possessed more knowledge than extension personnel of GO about all the aspects of computer technology andvarious aspects of internet technology. Further it was inferred that NGOs personnel had greater knowledge than GO personnel except some aspects of cell phone technology, whereas in case of various aspects of kisan call center GO respondents had greater knowledge than NGOs respondents.Results of the study indicates that there was significant difference in knowledge between GO and NGOs extension personnel about ICT tools. This difference in the knowledge of extension personnel might be due to the reason that NGOs respondents have more availability and accessibility of ICT tools in their office as well as home and using these ICT tools in daily life along with professional life.

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