

DETERMINANTS FOR NAVIGATING THE ICT KNOWLEDGE LANDSCAPE OF RESEARCH FACULTY

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ABSTRACT

The agricultural research and extension system is changing dramatically as a result of the quick development of artificial intelligence (AI). AI-powered tools are improving data analysis, decision-making and knowledge development, but information and communication technologies (ICTs) play a major role in the efficient interchange and distribution of this knowledge. In this context, understanding researchers' knowledge of ICT-based research processes becomes essential. Therefore, the study was carried to determine the knowledge of ICT based research life cycle among the research faculties of CCS Haryana Agricultural University, Hisar in 2023. All colleges of university were selected for collection of data. Data were collected personally from 120 research faculties. From the research study it was concluded that respondents had high knowledge about communication and collaboration howbeit, the respondents had less knowledge about data structuring and enhancement. Knowledge index showed that 67.99 percent of the research faculties had knowledge regarding ICT based research life cycle. Independent variable annual income was found more positively significant correlated at 5% level of significance with knowledge of ICT techniques among research faculty.

Keywords : research, data analysis, information and communication technology (ICT), decision making

INTRODUCTION

Agricultural research is becoming more accurate and efficient because to the quick development of artificial intelligence (AI). However, ICTs are still essential for promoting collaboration, knowledge sharing and pedagogical change in the research system. When used properly, they help to expand access to the education, reinforce the importance of education to the increasing digital environment, increase educational quality and mainly help in making the teaching-learning process into dynamic and active process which is associated with reality (Jyothi *et al.* 2020; Pratik and Vinaya, 2021; Pratik *et al.*, 2023). ICT have tremendous potential in timely collection of data and distributing it to the potential users even in developing countries, thus, providing low-cost access to information (Bhojani *et al.* 2016). ICTs offer opportunities to reach more people through easy access to local or global information and knowledge (Khodifad & Solanki, 2023). Knowledge about ICTs apparatus and its utility pattern helps in disseminating right information to the right user and at right time leads to modernization in agriculture (Bhuva *et al.* 2021). New ICT have the potential of getting vast amount of information for rural populations

in a more timely, comprehensive and cost-effective manner (Salunkhe *et al.* 2017).

According to Agwu *et al.* (2008), the majority of researchers (65%) had access to ICT facilities and 52.5% of them had a high level of expertise and comprehension of the accessible ICTs. The majority of the research staff, however, never used CD-ROM or video technologies. Oyewole *et al.* (2013) stated that agricultural researchers found relevant and useful agricultural knowledge that advanced agriculture by visiting and using particular agricultural websites. Research faculty members must keep up with new trends and refresh their expertise as technology change. Robelo and Bucheli (2018) concluded that ICT provides a range of resources for the search, analysis, selection and integration of knowledge and information to create theoretical and methodological frameworks for the production and distribution of research. In today's interconnected information environment, the use of ICT by research faculties is a crucial topic of study. Due to its critical role in addressing the information and communication demands of organisations and individuals, ICT has grown to be a significant component in academic institutions.

OBJECTIVE

To determine the knowledge on the ICT-based research life cycle among research faculties of CCS HAU

METHODOLOGY

Chaudhary Charan Singh Haryana Agricultural University, Hisar, Haryana was purposively selected of which a sample of 120 was selected from around 260 research faculties in various departments of all the colleges. Selection of the respondents was done by using the simple random sampling technique and the respondents for the study were operationalized as a faculty engaged in research courses. A well-structured questionnaire was prepared with inclusion of all independent and dependent variables of the study to measure the knowledge among respondents regarding ICT tools/techniques for data capturing, data structuring and enhancement, data analysis, data publishing and dissemination, communication and collaboration and strategy and project management. In the formulation of questions and statements, the investigator sought guidance from advisory committee, professor and available literature to make the questionnaire more reliable, precise and meaningful. A well-structured questionnaire was used to gather empirical data, which was then analyzed using the Statistical Package for Social Sciences (SPSS version 22) software. The study employed suitable statistical methods such as correlation coefficient, knowledge index, frequency and percentage. In order to gain their confidence, respondents were also briefed about the study's goal. They received assurances that their responses and privacy would not be disclosed to the public in any way and that the information gathered would only be utilised for research purposes.

Independent Variables

Sr. No.	Independent Variables	Tools for Measurement (s)
A.	Socio-economic and personal variables	
1	Age	Chronological age of the respondent
2	Gender	Male/Female category
3	Educational qualification	
4	Service experience	
5	Income of the respondent	
6	Family Income	Schedule was developed
7	Type of family	
8	Family education status	
9	Occupation of family	

Dependent Variable

Operationalized definition of Knowledge is a familiarity, awareness or understanding of someone or something such as facts, information, descriptions or skills which is acquired through experience or education by perceiving, discovering or learning.

RESULTS AND DISCUSSION

Knowledge of ICT based research life cycle

Producing proposals, creating models and experiments, gathering and analysing data, working with others, evaluating literature and producing papers are all part of a researcher's daily tasks. Thus, ICT has illustrated six particular aspects of research.

Table 1 indicated overall knowledge and mean score of respondents about ICT techniques. Data in the Table 1 depicted that mean score (97.4) and overall knowledge (81.16%) for communication and collaboration which included 5 sub statements was found highest among all the ICT techniques. Similar findings were reached by Marhefka *et al.* (2020), who found that researchers conducting social-behavioral studies switched to videoconferencing during periods of social distancing and beyond. They also found that the switch to videoconferencing helped to ensure the continuity of research and gave participants a way to benefit from potentially meaningful social interaction during a time of isolation. Ziegler's (2022) results are consistent with the current study's findings, which indicate that web 2.0 technology is made up of social networking sites like Facebook, Twitter, WhatsApp, Wikis, blogs and text/audio video sharing platforms. These platforms are emerging as crucial tools to boost productivity, communication and collaboration as well as to facilitate communication and knowledge sharing between individuals, including family, friends and total strangers which was followed by data capturing with mean score (95.3) and overall knowledge (79.44%) which included of 9 sub statements. The results contradict those of Farifteh *et al.* (2006), who found that the most popular methods and instruments for detecting and mapping soil salinity include solute transport modelling, geophysical surveys and remote sensing data which was followed by Strategy and project management with mean score (92) and overall knowledge (76.66%) which included of 6 sub statements. The results contrast those of Chaudhari *et al.* (2022), who discovered that respondents were knowledgeable about prototyping and that using it in research provided the researchers with better services. Whereas the mean score for data publishing and dissemination ICT technique was (85.25) and overall knowledge was found

Table 1: Distribution based on overall knowledge of ICT research life cycle

(n= 120)

Sr. No.	ICT Techniques	Total score	Mean score	Overall Knowledge
1	Data Capturing (9)	858	95.3	79.44%
2	Data structuring and enhancement (6)	336	56	46.6%
3	Data Analysis (8)	512	64	53.33%
4	Data publishing and Dissemination (8)	682	85.25	71.04%
5	Communication and Collaboration (5)	487	97.4	81.16%
6	Strategy and project management (6)	552	92	76.66%
Total (42)		3427	-	-

(71.04%) which included of 8 sub statements. Comparable results align with the findings of Manchu and Vasudevan (2018), who indicated that most academics were cognizant of institutional repositories and open access publishing and were enthusiastic about disseminating their work. The findings of this study align with those of Gatiti (2022), who noted the use of ICT-based tools, social media platforms and collaborative instruments for the extraction, sharing and dissemination of information in development organizations. Further, the mean score for data analysis ICT technique was (64) and overall knowledge was found (53.33%) which included of 8 sub statements. The findings were consistent with Sharma's (2017) study, which found that most respondents used ICT for communication, data analysis and therapy. ICTs were utilized for data collecting, processing, updating, analysis, printing and presentation, according to Tayade *et al.* (2011) and Verma *et al.* (2020); Sahu *et al.* (2025); Zade *et al.* (2024); Bhuva *et al.* (2024); Bharath *et al.* (2024); Zade *et*

al. (2024); Chauhan *et al.* (2016); Pratik and Vinaya (2021); Pratik *et al.* (2023). However, the mean score (56) and overall knowledge (46.66%) for data structuring and enhancement ICT technique which included of 6 sub statements was found least among all the six ICT techniques.

Knowledge index

Knowledge index is a composite metric designed to measure knowledge related capacity performance or outcomes. It was found by taking into account sum total of the questions replied correctly i.e. (3427) divided by total number of questions asked (42) and multiplied by total number of respondents (120) which came out to be (5040) and further multiplied by 100 to calculate the knowledge index in per cent which was (67.99%). Index showed that 67.99 percent of the research faculties had knowledge regarding ICT based research life cycle.

$$\begin{aligned}
 \text{Knowledge Index: } & \frac{\text{Total number of questions correctly replied}}{\text{Total number of questions asked} \times \text{Total number of respondents}} \times 100 \\
 & \frac{3427}{42 \times 120} \times 100 \\
 & = 67.99\%
 \end{aligned}$$

Correlation of independent variables with knowledge among research faculty

Data in Table 2 depicts the correlation coefficients between independent variables and various techniques related to ICT. Regarding correlation of all these ICT techniques with independent variable age was found to be positively correlated and for audio recorder and communication and collaboration (0.220*) was found positively significant correlated at 5% level of significance. Moreover, correlation with independent

variable education was found to be positively correlated for all the techniques/tools while for data structuring and enhancement was found negatively correlated (-0.031) at 5% level of significance. Further, result reveals that correlation with independent variable service experience and annual income was also found to be positively correlated and for speech recognition (0.213*), data analysis (0.227*) and data publishing (0.227*, 0.193* and 0.206*) was found to be positively significant correlated at 5% level of significance.

Table 2: Distribution of respondents based on Correlation of independent variables with Knowledge about ICT techniques

Sr. No.	ICT techniques	Correlation coefficient (r) Independent variable			
		Age	Education	Service experience	Annual Income
1	Data Capturing • Audio recorder • Speech recognition	0.220* 0.127	0.095 0.107	0.107 0.089	0.065 0.213*
2	Data structuring and enhancement	0.067	-0.031	0.065	0.102
3	Data analysis	0.086	0.116	0.066	0.227*
4	Data publishing and Dissemination • Desktop publishing • Image optimizer • Searching	0.086 0.077 0.127	0.116 0.039 0.107	0.066 0.123 0.089	0.227* 0.193* 0.206*
5	Communication and Collaboration	0.220*	0.095	0.107	0.161
6	Strategy and project management	-0.023	0.025	0.015	0.036

*correlation is significant at the 0.05 level

CONCLUSION

ICT is essential to improving the effectiveness, caliber and distribution of research activities in the modern research environment. Researchers can efficiently handle every stage of the study life cycle, from data collection to project management and information exchange, if they have a sufficient understanding of ICT technologies. From the present study it can be concluded that respondents had high knowledge for communication and collaboration ICT techniques however, the respondents had less knowledge about data structuring and enhancement ICT techniques. Knowledge index showed that 67.99 percent of the research faculties had knowledge regarding ICT based research life cycle. Independent variable annual income was found more positively significant correlated at 5% level of significance with knowledge of ICT techniques among research faculty. Based on the findings, regular capacity-building programmes, hands-on training and workshops should be organized to enhance researchers' knowledge of advanced ICT tools, particularly in the areas of data capturing, data analysis and project management.

RECOMMENDATIONS

- (1) The present study suggests that researchers should utilize online collaboration platforms like Google Drive or Microsoft One Drive for seamless sharing and collaboration on research documents and presentations and also identify and use specialized software tools relevant to researcher's domain.
- (2) Researchers should employ reference management tools

such as Mendeley, EndNote or Zotero to organize and cite research papers efficiently

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CONFLICT OF INTEREST

The authors declare no conflict of interest

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