

**USE OF INFORMATION AND
COMMUNICATION TECHNOLOGIES
(ICTs) AMONG FACULTY OF CCS
HARYANA AGRICULTURAL
UNIVERSITY, HISAR**

By
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CERTIFICATE – I

This is to certify that this dissertation entitled, “**Use of information and communication technologies (ICTs) among faculty of CCS Haryana Agricultural University, Hisar**” submitted for the degree of **Master of Science in Agriculture** in the subject of **Extension Education** to the Chaudhary Charan Singh Haryana Agricultural University, Hisar, is a bonafide research work carried out by **Mr. Ziaulhaq Haqyar** under my supervision and that no part of this thesis has been submitted for any other degree.

The assistance and help received during the course of investigation have been fully acknowledged.

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This is to certify that this dissertation entitled “**Use of information and communication technologies (ICTs) among faculty of CCS Haryana Agricultural University, Hisar**” submitted by **Mr. Ziaulhaq Haqyar (2019A62M)** to the **Chaudhary Charan Singh Haryana Agricultural University, Hisar** in partial fulfilment of the requirements for the degree of **Master of Science** in the subject of **Extension Education**, has been approved by the Student’s Advisory Committee after an oral examination.

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LIST OF CONTENTS

CHAPTERS	DESCRIPTION	PAGE (S)
1.	INTRODUCTION	1-3
2.	REVIEW OF LITERATURE	4-10
3.	MATERIALS AND METHODS	11-17
4.	RESULTS	18-29
5.	DISCUSSION	30-43
6.	SUMMARY AND CONCLUSION	44-46
	BIBLIOGRAPHY	i-v
	ANNEXURE	I-V

LIST OF TABLES

Table No.	Title	Pages
4.1	Distribution of respondents on the basis of their age	18
4.2	Distribution of respondents on the basis of their sex	18
4.3	Distribution of respondents on the basis of their educational qualification	19
4.4	Distribution of respondents on the basis of job experience	19
4.5	Distribution of respondents on the basis of family background	19
4.6	Distribution of respondents on the basis of parental occupation	20
4.7	Distribution of respondents on the basis of job preference	20
4.8	Distribution of respondents on the basis of Job Satisfaction	20
4.9	Distribution of respondents on the basis of job commitment	20
4.10	Distribution of respondents on the basis of training received on ICTs	21
4.11	Distribution of respondents on the basis of information seeking behavior	21
4.12	Distribution of respondents on the basis of availability of ICTs facilities	21
4.13	Correlation and regression analysis of respondents' personal profile with availability of ICT facilities	22
4.14	Distribution of respondents on the basis of accessibility of ICTs	23
4.15	Correlation and regression analysis of respondents' personal profile with accessibility of ICT facilities	23
4.16	Utilization pattern of ICTs for personal development	24
4.17	Utilization pattern of ICTs for teaching	25
4.18	Utilization pattern of ICT for research	25
4.19	Utilization pattern of ICT for extension	26
4.20	Correlation and regression analysis of respondents' personal profile with utilization pattern of ICT	27
4.21	Personal constraints faced in using of ICTs	27
4.22	Technical constraints faced in using of ICTs	28
4.23	Organizational constraints faced in using of ICTs	28
4.24	Correlation and regression analysis of respondents' personal profile with constraints in the use of ICT	29

LIST OF FIGURES

Figure No.	DESCRIPTION	Page(s)
3.1	Map of Haryana showing the locale of study	11
3.2	Criteria for selection of respondents	12
5.1	Distribution of respondents on the basis of age	30
5.2	Distribution of respondents on the basis of sex	31
5.3	Distribution of respondents on the basis of educational qualification	31
5.4	Distribution of respondents on the basis of job experience	32
5.5	Distribution of respondents on the basis of family background	32
5.6	Distribution of respondents on the basis of parental occupation	33
5.7	Distribution of respondents on the basis of job preference	33
5.8	Distribution of respondents on the basis of Job Satisfaction	34
5.9	Distribution of respondents on the basis of job commitment	34
5.10	Distribution of respondents on the basis of training received on ICTs	35
5.11	Distribution of respondents on the basis of information seeking behavior	35
5.12	Distribution of respondents on the basis of availability of ICTs services	36
5.13	Distribution of respondents on the basis of accessibility of ICT services	37
5.14	Usage pattern of ICTs for personal development	38
5.15	Usage pattern of ICTs for teaching	39
5.16	Usage pattern of ICT for research	39
5.17	Usage pattern of ICT for extension	40
5.18	Personal constraints faced in using of ICTs	41
5.19	Technical constraints faced in using of ICTs	42
5.20	Organizational constraints faced in using of ICTs	42

CHAPTER- I

INTRODUCTION

As the world's current population will rise from 7.4 to 9.1 billion by 2050, food production will need to increase over this similar time (FAO, 2016). Therefore to address agricultural difficulties i.e. satisfying the information needs of farmers in emerging nations and more effective extension services are required. Agricultural extension also known as agricultural advisory services which plays a critical role in promoting agricultural productivity, increasing food security, improving rural livelihoods, and promoting agriculture as a pro-poor economic growth engine. Agricultural extension professionals and institutions all around the world are encouraging agricultural extension and education agents to use information and communication technologies (ICTs) and it can help to speed up the dissemination of agricultural technologies and innovation from research and development organizations to farmers. It helps in farmers' learning, problem-solving, and access to viable markets for their crops also (World Bank, 2011).

Though developing countries like India were able to achieve food self-sufficiency with the green revolution, now they are in danger of losing this self-sufficiency due to deterioration and decline of natural resources i.e. soil and water etc. which leads to stagnation in production and food shortages in the near future due to continue increasing population. Thus, in these situations ICTs may use as a tool for redesigning agricultural education, research, and extension networks throughout the country, which may increase the adoption of new agricultural technologies and innovations.

ICT is a comprehensive word that incorporates all computer hardware and software, as well as digital broadcast and telecommunication technologies and online and offline digital information repositories. It also includes modern social networking features interfaces and online file sharing platforms.

ICT includes a wide range of technological tools and resources for creating, disseminating, storing, and managing data and information. Traditional ICT instruments i.e. as television, radio, and the telephone have previously proven their reliability and usefulness in enhancing knowledge and promoting development programmes in the communities. On the other hand, newer digital technologies i.e. as computers and internet play an important role in educational transformation and reforms. The ability to access and utilize information sources are prerequisite for improved targeting of extension, agricultural programmes and consulting services that promote information sharing and dissemination in the communities (Nain *et. al.*, 2015).

Agricultural extension in developing nations i.e. India, aims to boost agricultural production and increase farmers income. Extension is fundamentally a communication process in which multiple players are linked and exchange the information, and it is a critical necessity for development of farmers. Agricultural extension is currently confronted with a vast volume of inventions, discoveries, and information in various domains i.e. research, skills, and agricultural technology and has obtained the most recent discoveries from the resources of producing information and making it accessible to farmers, and it is required to have a robust and effective informing system to be developed in these important subjects (Harouni *et. al.*, 2012). ICT play a critical role in research and extension to increase professional capacity building among professionals (Arkhi *et. al.*, 2008).

ICTs in agriculture also known as e-agriculture and in agriculture field, it provides a diverse set of answers to a variety of issues. It is considered a new field that focuses on improving agricultural and rural development through better information and communication systems. Moreover, ICTs include devices, networks, mobile phones, services, and applications, which range from cutting-edge internet-era technologies and sensors to more traditional aids like fixed telephones, televisions, radios, and satellites.

It is observed that agricultural extension depends mostly on information exchange between and among farmers and a wide range of other actors i.e. extension workers. Frontline extension workers, who serve as a direct link between farmers and other actors in the agricultural knowledge and information system (AKIS), are well positioned to use ICT to gain access to expert knowledge or other types of information that might help them do their daily tasks (Omotayo, 2005).

Education systems around the world are under intense pressure to adopt innovative methodologies and integrate new information and communication technologies (NICTs) into the teaching and learning process in order to prepare students with the knowledge and skills they will need in the twenty-first century. According to reports, the teaching profession is shifting away from teacher-centered, lecture-based training and toward student-centered, interactive learning environments. ICT can be employed as an instructive, communicative, and situational instrument in the educational process (Malik, 2019).

E-learning has evolved as a tool for education over time. Nowadays, e-resources i.e. Scopus, Elsevier, CeRa, OPACs, and other similar databases are used get update and latest information about research, articles to publish, assignments, presentations, and seminars. It is found that use of e-learning for educational purposes provides significant advantages over traditional learning (Seoud *et. al.*, 2014). Moreover, many e-learning projects i.e. e- Gyanicas and e-Pathashala etc. projects have been launched by different organizations and institutes (Pallavi and Kumar, 2013).

The national policy for ICT in education, which is currently being developed also emphasizes the importance of include ICT as a subject in the curriculum as well as improving the entire teaching learning process. Its advancements should be put to use improve the quality of learning as well as to increase access to learning (Panikker, 2009). ICTs are now being used in education in a highly creative and successful way. Apart from making learning and teaching more engaging, ICTs provide teachers and students with opportunities to gather information, which not only makes learning more appealing and fascinating, but increases listener retention also. The education becomes more target oriented, and two-way communication as a result of the integration of these technologies. The current use of ICTs in teaching, research and extension can be increase to assess their usefulness.

Simultaneously ICTs are challenge to teachers, researchers and extension specialists in terms of subject specific, technical and proper utilization in agricultural field. Therefore, it is critical to understand the availability, accessibility, usage pattern and constraints faced by faculty members while using ICT tools.

Keeping in view the above facts, the present study entitled ‘Use of information and communication technologies (ICTs) among faculty members of CCSHAU, Hisar’ was proposed with following objectives:

1. To study the availability and accessibility of ICT services among faculty
2. To determine the usage pattern of ICT tools among faculty
3. To delineate the constraints faced by faculty in using ICT

Scope and importance of the study

The present study will provide a deep insight about the availability, accessibility, utilization pattern and constraints faced by the faculty members of CCSHAU, Hisar. Moreover, it may be useful for developing an action plan regarding availability and accessibility of ICT tools and encounter the constraints which are faced by faculty members. However, it is expected that findings of the study will help to prepare the training programmes on ICTs for the faculty members.

Limitation of the study

The study has following limitation:

1. Four colleges namely COA, COAE&T, COBS&H, COHS of the CCSHAU, Hisar are covered in the study. So, the results cannot apply to other academic institutions.
2. The investigation being a student’s project for practical fulfilment of M.Sc. degree had the usual constraints i.e. time, mobility and funds etc. due to which study could not be conducted on the large area and could not include the outstation i.e. KVKs and RRS of the university.
3. The study also suffered from disparity of literature since only few studies are available on ICTs on faculty members of State Agricultural universities (SAU’s).
4. The current study also suffers from the standard limitation of social science research.

CHAPTER- II

REVIEW OF LITERATURE

In any subject of research, a review of prior findings is quite beneficial. It is an essential component of every research project, as it aids in the development of acceptable study designs and the analysis of research findings. It also serves as a foundation for the study's interpretation and presentation. As a result, the focus of this chapter is on the presentation of reviews derived from a review of relevant literature. The review of literature for the study is presented under broad heads:

2.1 Profile of the respondents'

2.2 Availability and accessibility of ICT services

2.3 Usage pattern of ICT tools

2.4 Constraints in using of ICTs

2.5 Profile of the respondents'

Jirapure (1991) reported that majority of the agricultural students (73.43%) had urban background.

Zhang (2005) found that internet efficiency was proportional to age, gender, and level of education. He found also that young age group was more confident in using the internet than older age group of employees.

Thomas and Parayil (2008) reported that 84.6 percent of all rural persons who used a computer belonged to the highest educated category in Kuppam of Andhra Pradesh.

Baliram (2009) opined that younger scientists had more expertise and use of ICT than older and middle age scientists.

Dhaka and Chayal (2010) revealed that (44.00%) had a medium exposure to the mass media, followed by high (30.67%) and low (25.33%), respectively.

Rehman *et. al.* (2010) reported that 61.00 per cent respondents were male and 38.70 per cent were female in category of internet usage.

Egomo *et. al.* (2012) suggested that government should develop appropriate ICT policies, and workshop training programmes for teachers at all levels of education system.

Singh *et. al.* (2014) observed that almost half of the respondents 49.00 per cent reported agriculture as their main family occupation, followed by service (34.00%) and business 17.00(%)

Raksha and Meera (2015) use of ICTs in agricultural extension system is very much affected by the age, education, number of years of service, possession of smart gadgets, source of awareness about ICTs, methods of learning ICTs, training received etc.

Bellary *et. al.* (2015) discovered that the majority of respondents needed training on the most recent developments in the different fields.

Umar *et. al.* (2015) investigated awareness and use of ICTs among extension in Kaduna state of Nigeria and they found that material status, educational level, level of training and membership of associations were significant factors influencing the use of ICT in the study area.

Darko and Amanor (2016) found that salary packages, coworker relationships and the availability of appropriate equipment at work place etc. leading the job satisfaction.

Mavellas *et. al.* (2016) most of the ICTs needed for training are either unavailable or insufficient.

Agha (2018) concluded that majority of the extension personnel (66.66%) belong to middle age group, more than 50 per cent respondents were high job satisfaction, whereas, only one-third were highly commitment to accomplish job assignment in routine followed by urgency (60.00%).

Malik *et. al.* (2020) reported that age, education, medium of schooling, schooling, parental income, family education, scientism, job preference, annual expenditure, mass media exposure, information seeking behavior and risk orientation with their usage behavior of internet had positive and significant correlation at 0.05 level of probability.

2.2 Availability and accessibility of ICT services

Asemi (2005) found that all of the faculties used the internet because they had internet access. He also reported that 55 per cent of respondents used the internet to find scientific health information.

Kumar and Kaur (2005) reported that the internet had become a vital instrument for teaching, research and learning process of the respondents.

Nazim and Saraf (2006) found that 44.44 per cent of internet users at Banaras Hindu University accessed the internet through the central library, 31.98 per cent retrieved it through cyber cafes, while 13.46 per cent accessed it through concerned departments, and only 10.10 per cent accessed it through the computer center's facility.

Agwu *et. al.* (2008) described that the common of researchers (52.5%), extension workers (57.50%), and farmers (56.7%) had high, moderate, and poor understanding of available ICTs.

Salau and Saingbe (2008) found that researchers had 87 percent access, whereas extension workers only had 66 per cent access to ICT facilities.

Afolabi (2009) stated that university should make every effort to make ICT facilities available and accessible to their faculty and staff. Further, he also suggested the step toward removing barriers that prevent students from making efficient use of ICT resources in Nigerian university.

Adedeji (2011) reported that governments should invest to provide ICT facilities to schools for training purposes because he found that majority of available tools are used only for administrative purposes.

Jude and Dankaro (2012) found that ICT resources were unavailable in the college so that teachers were unable to use them for instructional purpose.

Agwu and Elizabeth (2013) investigated that majority of the women in agriculture staff had access to telephone, television and radio, respectively, while, very few of them had access to digital ICT facilities i.e. computer, internet and printer.

Bello *et. al.* (2013) revealed that the majority of the facilities available are inaccessible to librarians, while only multimedia projector, internet access, and office equipment were available.

Stephen (2013) found that most physics professors are aware of ICT tools i.e. computers, televisions, video cassettes, audio tape players, slide projectors, and overhead projectors. He also reported that majority of secondary schools in the state are not connected to the internet.

Orioguet. *al.* (2014) reported that the majority of ICT facilities in the university library are available and accessible, with the exception of the scanner, CD-ROM, and projector, which are not available and accessible.

Samansiri and Wanigasundera (2014) revealed that all of the respondents had availability of mobile phones/fixed phones (95.00%) as ICT tools for extension activities.

Tiwari *et. al.* (2014) found that in the plains, the majority of respondents (61.25%) had medium access to ICT, but in the hills (50%) had low access to ICT facilities.

Apagu and Wakili (2015) observed that some of the advantages of adopting ICT at technical colleges include making teaching and learning more engaging, assisting teachers in staying current, and improving the quality of work of both teachers and students.

Gabadeen *et. al.* (2015) reported that e-learning technologies were available for teachers and students. They were sufficiently and properly accessible.

Mugwisi *et. al.* (2017) studied that majority of respondents (69.00%) had access to a computer in the office. However, 30.70 per cent indicated no access to a computer.

Agha *et. al.* (2018a) concluded that 44.4 percent of extension personnel had ICT facilities in their department among which computer and printer facilities were possessed by half of the respondents. However, internet and digital camera were possessed by 30.0 percent of respondents.

2.3 Usage pattern of ICT tools

Frizzier (1995) reported that computers cannot completely replace the instructors, but they can provide outstanding and tools to help teachers improve their classroom instructions.

Cuban (2001) reported that university students in America country mostly used computers for word processing, internet searching and email, whereas teachers primarily used computers for research rather than classroom instruction.

Adeyemi (2002) opined that advances in information technology and globalization have liberalized information retrieval and use of electronic information resources for students during the last years. Further, he stated that the reason for this is that most of educational information resources i.e. the internet, CD-ROMs, OPACs, electronic journals, and electronic books were available in digital format.

Ansari (2006) investigated that internet use by Kuwait University faculty members and found that computers and the internet used to find up-to-date information, and they all expressed a desire in improving their internet use through formal training.

Madukwe (2006) concluded that ICTs in agricultural extension was used to collection, processing and transformation of data, resulting in faster extension of quality information to more farmers in a bottom-up and interactive channel of communication.

Mooventhan (2006) found that only 22.22 percent of farmers utilize agricultural websites, while the rest (77.78%) of farmers use the internet for non-agricultural activities.

Adebayo and Adesope (2007) revealed that female researchers (55.7%) and female extension professionals (70.4%) used ICT i.e.3 to 5 times in a week. World Wide Web, electronic mail, electronic spreadsheet, word processing, CD-ROM, projector, computer, web design, and chat room are examples of ICT used by female researchers and extension professionals.

Olatokun (2007) observed that respondents used computers, printers, internet, individual websites, photocopiers, telephones, and mobile phones more than scanners, facsimiles, videoconferencing, and teleconferencing. Women academics also used ICT for a variety of duties, including statistical analysis, word processing, internet browsing and searching for information, electronic communications, and course material preparation etc.

Agwu *et. al.* (2008) opined that researchers used 11 of the 24 ICT tools most frequently, while extension workers and farmers used only 4 and 3 of the facilities, respectively.

Salau and Saingbe (2008) discovered that researchers (84%) and extension workers (70.3%) on the amount of use of ICTs for agricultural communication, in Nasarawa State of Nigeria.

Parameshwar and Patil (2009) observed that about half of Gulbarga University's academics and research scientists use the internet for research and education, while 33 per cent used the internet to communicate with colleagues and scholarly journal editors and 15 per cent used it for entertainment purpose.

Sharma (2009) found that the web and e-mail are the second and third most popular e-resources (57.69%) after e-journals (78.84%) use among Guru Gobind Singh Indraprastha University instructors, respectively, and 76.66 and 60.00 per cent use among researchers, respectively.

Chauhan (2010) reported that farmers used the internet mostly to acquire agricultural and trade information, and to learn more about market prices. They also used the internet for their children's schooling, and to communicate with both foreign and Indian family.

Tunji *et. al.* (2011) reported that usage of electronic resources was major success among academic staff and it had a positive impact on teaching and research.

Tayade *et. al.* (2011) concluded that scientists from various departments of selected KVKs and RRS (Soybean) in the Amravati district observed that majority of the respondent scientists (73.33%) utilized ICTs for data updating, data analysis, locating references, searching for details about subjects, printing, and presentations. Computer set (46.7%), printer (41.7%), and bulletin board (31.0 %) were the most regularly used ICT facilities.

Ahmed (2015) opined that male faculty members use ICT more frequently in the teaching learning process than the females. The findings also explain that young faculty members are more likely to use ICT than other age groups.

Gore and Dawne (2016) found that (75.00%) of the respondents using ICT facilities for communication with other scientists. However, 74.17 per cent respondents using ICT facilities for computer information retrieval or data updating

Malik *et. al.* (2017) concluded that e-agriculture can revamp the extension advisory service with providing proper training to extension personal on IT/ICT and its application in agricultural extension. He also reported that internet, the base of ICT can overcome some of these most challenging issues related to advisory services i.e. accessibility, literacy and language barriers etc.

Rohila *et. al.* (2017) suggested that ICT is going to play greater role in agricultural extension as well as private sector agribusiness, market information and market intelligence to the farming communities.

Agha *et. al.* (2018b) that majority of the extension personnel used mobile phone to seek farmers' participation and to deliver timely extension & advisory services to stakeholders. He also reported that computer was used for browsing the internet for search of agricultural information followed by documentation, social media for dissemination of information, e-mail, MS Power Point and, use of expert system for technical advisory.

Verma *et. al.* (2020) stated that students and staff at concerned universities use ICT resources in their teaching and learning to make lectures more interactive, as well as in research and project development. Moreover, ICT resources are used in university functions, placement, admissions, accounting, staff and student control, planning and management etc.

Study also concluded that ICT is viewed by both students and teachers as a resource for knowledge exchange and as a tool for integrating disparate information and knowledge throughout the globe. ICT has also been discovered to broaden the scope of students, teachers, and stakeholders in their fields of study, as well as pique their interest in teaching-learning and development.

Malik *et. al.* (2021) concluded that most of the respondents used ICT tools or services for browsing social networking sites and entertainment purpose compared to academic and research purpose.

2.4 Constraints in using of ICTs

Jones and Yale (2005) found that lack of training on how to use the technologies and insufficient technical assistance, lack of ability to learn new technologies were major challenges.

Meena (2005) identified several types of constraints faced by managers of dairy cooperative societies (DCSs) i.e. slow server connectivity, lack of funds, supervisory computer handling, computer maintenance costs, and insufficient electricity supply.

Roknuzzaman (2006) described that most major concern was shortage of sufficient computers and accessories, financial inability to buy computers and related technologies, as well as maintain lab facilities for both teachers and students. However, lack of expert, space problem in organizing computers and internet technology in their departments. Another limitation for proper use of computer and internet connection in the campus was interrupted power supply.

Adebayo and Adesope (2007) reported that the majority of respondents didn't have computers in their offices and they didn't have internet access also.

Agwu *et. al.* (2008) reported that lack of sufficient trained computer personnel, erratic power supply, poor finance and lack of internet access in rural areas, poor communication network, high cost of ICTs software and high cost of ICTs hardware were major constraints.

Salau and Saingbe (2008) explained that poor access to ICT facilities, lack of computer experience, low money, and poor power supply were identified as major barriers to ICT adoption in the area.

Ahmad and Fatima (2009) observed that the male researchers' biggest challenges were lack of training (87.87%), lack of technical understanding (75.75%) and a restricted number of computers (57.57%). While, lack of training (90.90%), lack of technical understanding (77.27%) and restricted number of computers (63.63%) were major issues in case of female researchers.

Tunji *et. al.* (2011) reported that the most common challenges encountered by the majority of respondents are delays in getting relevant information (69.4%) and difficulty in discovering relevant information (21.30%).

Omotesho *et. al.* (2012) reported that high cost of ICT equipment, inadequate electricity supply, weak communication and high cost of internet access were major constraints common to extension agents and matter specialists in terms of their access to ICT.

Agwu and Elizabeth (2013) reported that lack of training opportunities, insufficient availability of ICT facilities and lack of technical know-how were serious constraints to the use of ICTs.

Ohwerei *et. al.* (2013) reported that lack of computers, lack of trained teachers to teach ICT in schools, lack of electricity, fear of becoming outdated, lack of internet access and outmoded computers were major issues.

Sireesha *et. al.* (2014) reported that lack of technically qualified individuals, ICT tool maintenance, internet connectivity interruptions, insufficient budget allocation, lack of ICT equipment up gradation, and the problem of viruses and junk mails were major barriers in use of ICT.

Ani *et. al.* (2016) concluded that lack of funds, high cost of internet use, lack of access to ICT resources, lack of ICT skills, and lack of awareness of ICT-based library resources were major challenges which affect the use of ICT resources.

Kale *et. al.* (2017) reported that lack of experience in using ICT, slow internet, lack of ICT training, and lack of awareness among farmers about ICT usage for educational and agricultural purposes were the primary restrictions in use of ICT.

Rohila *et. al.* (2019) reported that lack of training to access e-information, followed by low internet access and electricity, inadequate infrastructural facilities, 'lack of resources and tools, and fear that ICTs provides irrelevant content were major constraints.

Anand *et. al.* (2020) found that the majority of farmers were dealing with insufficient power supply (2.84), followed by poor or slow internet connection (2.83), lack of knowledge (2.82), lack of trust in using ICT tools (2.79), and lack of training programme (2.71).

Agha *et. al.* (2018a) found that less knowledge of farmers about ICTs and lack of specialized trainings received on ICTs by field functionaries were very serious constraints in use of ICT tools.

Raviya *et. al.* (2020) concluded that insufficient knowledge abilities to use ICT, high charge of some devices and services, lack of methodical awareness to operate the tools, difficulty in understanding the language of devices, lack of attention in using recent tools of ICT etc. were major limitations.

CHAPTER- III

MATERIALS AND METHODS

The chapter deals with the background information about the study area, variables and their measurements, methods and the procedures adopted for the collection of data required for the study. It also describes the method and tools used for analysis of data. For better comprehension, the chapter is divided into following under broad heads:

- 3.1 Locale of the study
- 3.2 Sampling procedure
- 3.3 Variables and their measurements
- 3.4 Construction of questionnaire
- 3.5 Collection of data
- 3.6 Analysis and interpretation of data

3.1 Locale of study

The study was carried out at Chaudhary Charan Singh Haryana Agricultural University, Hisar commonly known as CCSHAU. It is one of Asia's largest agricultural universities located at 29.14N and 75.70E Hisar in the Indian state of Haryana.



Fig. 3.1: Map of Haryana showing the locale of study

3.2 Sampling procedure

Four colleges i.e. CoA, COA&ET, COBS&H, and COHS of CCSHAU were selected, purposively. Further, 25 faculty members were selected randomly from each selected college.



Fig. 3.2: Criteria for selection of respondents

3.3 Variables and their measurements

Independent and dependent variables were selected keeping in minds the objectives of this study. These variables and their measurements are given in the following sections.

3.3.1 Independent variables

Eleven independent variables were selected for the present study. The variables and the scales used for measuring them are given below:

S. No.	Independent Variables	Tools for Measurement(s)
1.	Age	Chronological age of the respondent
2.	Sex	Biological Male/Female
3.	Educational Qualification	Schedule was developed
4.	Job Experience	Schedule was developed
5.	Rural-Urban background	Schedule was developed
6.	Parental Occupation	Schedule was developed
7.	Job Preference	Schedule was developed
8.	Job Satisfaction	Schedule was developed
9.	Job Commitment	Schedule was developed
10.	Training received on ICTs	Schedule was developed
11.	Information seeking behaviour	Schedule was developed

3.3.1.1 Age

Age was operationalized as the number of years the respondent has completed at the time of data collection. The respondents were classified into three categories i.e. young, middle and old.

S. No.	Particulars	Score
1.	Young (20-35)	1
2.	Middle (36-50)	2
3.	Old (51and Above)	3

3.3.1.2 Sex

Sex in this study referred to the biological gender of the respondents. The respondents were classified into two categories (male and female) based on their sex.

S. No.	Particulars	Score
1.	Male	1
2.	Female	2

3.3.1.3 Educational qualification

Educational qualification in this study refers to the number of years of formal education attained by the respondents at the time of data collection. It was categorized into following categories.

S. No.	Particulars	Score
1.	M.Sc.	1
2.	Ph.D.	2
3.	Post-Doctorate	3

3.3.1.4 Job experience

Job experience refers to the number of years as faculty by the respondent has completed in the university at the time of data collection. It was categorized in eight sub-categories as following.

S. No.	Particulars	Score
1.	0-5	1
2.	5-10	2
3.	10-15	3
4.	15-20	4
5.	20-25	5
6.	25-30	6
7.	30-35	7
8.	35-40	8

3.3.1.5 Rural-urban background

It referred to the social background of the respondent i.e. the place where his family has lived. Rural means living in village and urban means living in cities and semi-urban means living in town and it was measure in the following categories.

S. No.	Particulars	Score
1.	Rural	1
2.	Urban	2
3.	Semi Urban	3

3.3.1.6 Parental occupation

It referred to the type of income generating activity of the respondent's parents. It was measured in five sub-categories as following:

S. No.	Particulars	Score
1.	Farming	1
2.	Labour	2
3.	Shopkeeper	3
4.	Service	4
5.	Businessman	5

3.3.1.7 Job preference

Job preference is liking or desire for a particular job over another. Job preference was categorized in these categories i.e. teaching, research and extension.

S. No.	Particulars	Score
1.	Teaching	1
2.	Research	2
3.	Extension	3

3.3.1.8 Job satisfaction

Degree of satisfaction towards the job and factors directly affect his/her performance in the university/organization/institute. A list of major factor was prepared and response was collected on three point continuum scale i.e. highly satisfied, satisfied and not satisfied. However, weightage was given 3, 2 and 1, respectively. Further, respondents were categorized into low, medium and high categories.

S. No.	Particulars	Highly Satisfied (3)	Satisfied (2)	Not Satisfied (1)
1.	Job security			
2.	Salary and other allowances			
3.	Career advancement scheme			
4.	Status attached to the job			
5.	Interpersonal relationship			
6.	Physical facilities available			
7.	Freedom to express idea			
8.	House/office accommodation			
9.	Opportunity for development			
10.	Recognition and reward			

3.3.1.9 Job commitment

Job commitment refers to the amount of time devoted or utilized by faculty members to perform assigned job activities and other assigned duties. For positive statement score was given 5, 4, 3, 2 & 1, respectively, while, for negative statement score was given 1, 2, 3, 4, 5, respectively. Further respondents were categorized into low, medium and high categories of job commitment.

S. No.	Particulars	SA	A	N	D	SD
	For positive statements	5	4	3	2	1
	For negative statements	1	2	3	4	5
1.	I always reach at office timely					
2.	Stay late in office for other assigned job					
3.	Ready to accept any other assignment for university					
4.	My and university values are very similar					
5.	Proud to tell others that I am part of CCSHAU					
6.	CCSHAU inspires for better job performance.					
7.	I am extremely glad that I chose this university for job					
8.	Deciding to work for this university was a definite mistake on my part					
9.	Your job commitment affects other work					
10.	Any Other (Please Specify)					

3.3.1.10 Training received on ICTs

It referred to any training the respondent has received or attended on ICT in his/her tenure as faculty of CCS HAU, Hisar.

Particulars	Yes (2)	No (1)
Training received on ICTs		

3.3.1.11 Information seeking behavior

It was referred as the use of different sources of information by the respondent for the purpose of gaining information, news and updates. Faculty members were asked that how frequently they used information sources i.e. regularly, occasionally and never. The weightage were give 3, 2 and 1, respectively. Further, respondents were categorized into low, medium and high categories.

S. No.	Particulars	Regularly (3)	Occasionally (2)	Never (1)
1.	Friends and relatives			
2.	Radio/ Television			
3.	Internet			
4.	Print media			
5.	Social Media			
6.	Magazine			
7.	Any other (Please Specify)			

3.3.2 Dependent variables

The following dependent variables were selected for the present study:

S. No.	Dependent Variables	Tool for measurement
1.	Availability and accessibility	Schedule was developed
2.	Usage Pattern	Schedule was developed
3.	Constraints	Schedule was developed

3.3.2.1 Availability and accessibility

Availability means the ICT tools are available to faculty members at department/office. This variable was measured by constructing a questionnaire. The response of faculty was collected on two point continuum scale i.e. yes and no and score was assigned 2 & 1, respectively. However, accessibility can be viewed as the ability of access. A questionnaire was also developed to measure the accessibility of ICT services among faculty and response was collected on two point continuum scale i.e. yes and no and score was assigned 2, & 1, respectively. Questionnaire was developed to measure the availability and

accessibility after detailed discussion with advisory committee, experts and professionals. Moreover, available literature also reviewed for preparation of the questionnaire.

3.3.2.2 Usage pattern

It refers to the use of ICTs by the respondents. Further, the responses under this variable were collected under four sub-categories i.e., utilization pattern of ICTs for personal development, utilization pattern of ICTs for teaching, utilization pattern of ICTs for research and utilization pattern of ICTs for extension purpose. Usage pattern of ICTs were measured by constructing the questionnaire prepared after detailed discussion with advisory committee and other faculty members. The responses were collected into two point continuum scale i.e. yes and no, and weightage was given 2 and 1, respectively.

3.3.2.3 Constraints

It referred to the problems or hurdles faced by the respondents in accessing and using the ICTs. The constraints were grouped into three sub- categories: personal constraints, technical constraints and organizational constraints. Further the respondents were asked to rate all the statements in above mentioned categories based in their seriousness into very serious, serious and not serious. Weightage was give 3, 2 & 1, respectively. A list of constraints was prepared after discussion with advisory committee and faculty members.

3.4 Construction of questionnaire

A well-structured questionnaire was prepared for collection of data for the present study as given in appendix-1. In the formulation of questions and statements, the investigator sought guidance from advisory committee, professor, scientists, experts and available literature to make the questionnaire more reliable, precise and meaningful. The construction of questionnaire was done strictly in accordance with already approved objectives in the synopsis.

3.5 Collection of data

The data was collected from the faculty members of the four colleges (COA, COAE&T, COBS&H and COH) with the help of questionnaire/goggle form. Respondents were informed also about the purpose of the study to take them into the confidence. They were assured that the information collected will be used only for research purpose and their response and privacy will not be public in any manner.

3.6 Analysis & interpretation of data

The data was tabulated, analysed and interpreted keeping in view the objectives of the study. Appropriate statistical tools and methods were used for the analysis of data.

CHAPTER- IV

RESULTS

This chapter deals with the presentation of results of the investigation after the analysis and interpretation of data. For better comprehension, the results have been presented under the following broad heads:

- 4.1 Profile of the respondents'
- 4.2 Availability of ICTs services among faculty
- 4.3 Accessibility of ICTs services among faculty
- 4.4 Usage pattern of ICT tools among faculty
- 4.5 Constraints faced by faculty in using of ICTs

4.1 Profile of the respondents'

Profile of the respondents presents a brief account of the personal, social and job background of the respondents. In the field of social science, it is essential to analyze the characteristics of the respondents to get a clear picture of their background. This section includes the independent variables of the respondents i.e. age, sex, educational qualifications, job experience, rural-urban background, parental occupation, job preference, job satisfaction, job commitment, training received and information seeking behaviour. The findings on these characteristics are below:

4.1.1 Age

Table 4.1 indicates that the more than half of respondents (51.00%) belonged to middle age group, followed by old age group (25.00%) and the rest of the 24.00 per cent respondents belonged to the young age group.

Table 4.1: Distribution of respondents on the basis of their age (n=100)

S. No.	Particulars	Frequency	Percentage
1.	Young (20-35)	24	24.00
2.	Middle (36-50)	51	51.00
3.	Old (51 and Above)	25	25.00

4.1.2 Sex

It is evident from the Table 4.2 that more than half of the respondents belongs to male group (53.00%), followed by the female group (47.00%).

Table 4.2: Distribution of respondents on the basis of their sex (n=100)

S. No.	Particulars	Frequency	Percentage
1.	Male	53	53.00
2.	Female	47	47.00

4.1.3 Educational Qualification

Table 4.3 shows that majority of the respondents education qualification was Ph. D (86.00%), followed by post-Doctorate (8.00%) and M.Sc. (6.00%).

Table 4.3: Distribution of respondents on the basis of their educational qualification (n=100)

S. No.	Particulars	Frequency	Percentage
1.	M.Sc.	06	06.00
2.	Ph.D.	86	86.00
3.	Post-Doctorate	08	08.00

4.1.4 Job Experience

Table 4.4 reveals that majority of respondents (28.00%) had job experience of 0-5 years, followed by 10-15 years (22.00%) and 5-10 years (18.00%). Further, 15 per cent respondents had a job experience of 30-35 years while, remaining 8.00 per cent respondents had experience of 25-30 years.

Table 4.4: Distribution of respondents on the basis of job experience (n=100)

S. No.	Particulars	Frequency	Percentage
1.	0-5	28	28.00
2.	5-10	18	18.00
3.	10-15	22	22.00
4.	15-20	07	07.00
5.	20-25	02	02.00
6.	25-30	08	8.00
7.	30-35	15	15.00

4.1.5 Rural-urban background

The table 4.5 explains that most of the respondents had urban background (48.00%), followed by rural background and Semi-Urban background, 40 and 12 per cent, respectively.

Table 4.5: Distribution of respondents on the basis of family background (n=100)

S. No.	Particulars	Frequency	Percentage
1.	Rural	40	40.00
2.	Urban	48	48.00
3.	Semi Urban	12	12.00

4.1.6 Parental occupation

The table of 4.6 presents that about two-third respondents' parental occupation was service (64.00%), followed by farming (26.00%) and labour (5.00%). Only three per cent were shopkeeper and 2.00 per cent of respondents' parental occupation was businessman.

Table 4.6: Distribution of respondents on the basis of parental occupation (n=100)

S. No.	Particulars	Frequency	Percentage
1.	Farming	26	26.00
2.	Labour	05	05.00
3.	Shopkeeper	03	03.00
4.	Service	64	64.00
5.	Businessman	02	02.00

4.1.7 Job Preference

It is obvious from Table 4.7 that more than fifty per cent of respondents had teaching preference (58.00%), followed by the research (34.00%) and only seven per cent of the respondents had job preference as extension.

Table 4.7: Distribution of respondents on the basis of job preference (n=100)

S. No.	Particulars	Frequency	Percentage
1.	Teaching	58	58.00
2.	Research	34	34.00
3.	Extension	07	07.00

4.1.8 Job Satisfaction

The table of 4.8 reveals that more than two-third respondents had medium level of job satisfaction i.e. (72.00%), followed by high level (18.00%). However, only 10.00 per cent of the respondents had low level of job satisfaction.

Table 4.8: Distribution of respondents on the basis of Job Satisfaction (n=100)

S. No.	Category	Frequency	Percentage
1.	Low (17-22)	10	10.00
2.	Medium (22-26)	72	72.00
3.	High (26-30)	18	18.00

4.1.9 Job Commitment

Table 4.9 describes that more than two-third of the respondents had medium level of job commitment (70.00%), followed by low level and high level each 15.00 per cent, respectively.

Table 4.9: Distribution of respondents on the basis of job commitment (n=100)

S. No.	Category	Frequency	Percentage
1.	Low (20-29)	15	15.00
2.	Medium (29-37)	70	70.00
3.	High (37-46)	15	15.00

4.10 Training received on ICTs

This table (4.10) shows that more than half of respondents (61.00%) received training on ICTs at university or outside the university, while only 39.00 per cent of them did not receive any type of training on ICTs.

Table 4.10 Distribution of respondents on the basis of training received on ICTs

Particulars	Yes	No
Training received on ICTs	61	39

4.11 Information seeking behavior

Table 4.11 elaborates that two-third of the respondents had medium level of information seeking behaviour (69.00%), followed by the low level (16.00%). However, rest of the 15.00 per cent of the respondents had high level of information seeking behavior.

Table 4.11: Distribution of respondents on the basis of information seeking behaviour (n=100)

S. No.	Category	Frequency	Percentage
1.	Low (10-14)	16	16.00
2.	Medium (14-18)	69	69.00
3.	High (18-22)	15	15.00

4.2 Availability of ICTs services among faculty

The data in Table 4.12 indicates that all of respondents had computer/laptop, internet, e-mail, and mobile phone/ telephone facilities available at department/workplace. While majority of the respondents also had printer (97.00%), scanner (83.00%), photocopier (77.00%) and LCD projector (74.00%). However, more than half of the respondents possess digital camera (59.00%) and interactive kiosk (52.00%).

Table 4.12: Distribution of respondents on the basis of availability of ICT services among faculty (n=100)

S. No.	Particulars	Available (F)	Available (%)	Not Available (F)	Not Available (%)
1.	Computer	100	100.00	00	00.00
2.	Printer	97	97.00	03	03.00
3.	Photocopier	77	77.00	23	23.00
4.	Scanner	83	83.00	17	17.00
5.	Internet	100	100.00	00	00.00
6.	E-mail	100	100.00	00	00.00
7.	Digital Camera	59	59.00	41	41.00
8.	LCD Projector	74	74.00	26	26.00
9.	Interactive kiosk in class room	52	52.00	48	48.00
10.	Mobile Phone/Telephone	100	100.00	00	00.00

4.2.1 Correlation and regression analysis of respondents' personal profile with availability of ICT services

Table 4.13 reveals that job commitment had positive and significant correlation with availability of ICT services, whereas age, sex, education qualification, rural-urban background, parental occupation, job experience, job satisfaction, training, and information seeking behavior do not show any significant association at 0.05 level of probability. While in case of partial regression coefficient of faculty members with availability of ICTs only job commitment was found significant. However, age, sex, educational qualification, job experience, rural-urban background, parental occupation, job preference, job satisfaction, training, and information seeking behavior did not contribute to availability of ICTs with faculty members.

Further, it is concluded that 11 independent variables included in the study jointly contributed 11.00 per cent variation in the availability of ICTs with faculty members when other factor kept constant. It means only 11.00 per cent of the variation in the dependent variables was due to these variables and remaining 89.00 per cent variation in the study due to other variables.

Table 4.13: Correlation and regression analysis of respondents' personal profile with availability of ICT services (n=100)

Variable	Correlation Coefficient	Regression Coefficient	't' values
Age	-0.001 ^{NS}	-2.005	-1.483 ^{NS}
Sex	-0.046 ^{NS}	-0.892	0.690 ^{NS}
Education Qualification	0.054 ^{NS}	-0.367	-0.274 ^{NS}
Job Experience	0.088 ^{NS}	0.781	1.778 ^{NS}
Rural-Urban Background	0.085 ^{NS}	0.880	1.118 ^{NS}
Parental Occupation	0.016 ^{NS}	-0.178	-0.452 ^{NS}
Job Preference	0.058 ^{NS}	0.601	0.754 ^{NS}
Job satisfaction	0.062 ^{NS}	-0.013	-0.094 ^{NS}
Job commitment	0.252*	0.290	2.321*
Training	0.024 ^{NS}	0.055	0.052 ^{NS}
Information seeking behaviour	0.067 ^{NS}	0.079	0.309 ^{NS}

Dependent Variable: Availability of ICT facilities

*Significant at 5 per cent level

$R^2 = 0.116$; Constant Value = 5.010

4.3 Accessibility of ICT services among faculty

It is evident from Table 4.14 that all of the respondents had access to computer/laptop, printer, internet, e-mail and mobile phone at department/office and ranked 1st with weighted mean score (WMS) 2.00.

Table 4.14: Distribution of respondents on the basis of accessibility of ICT services**(n=100)**

S. No.	Particulars	Office/ Own	Cyber Cafe/ Hire	TWS	WMS	Rank Order
1.	Computer	100	00	200	2.00	I
2.	Printer	100	00	200	2.00	I
3.	Photocopier	76	12	176	1.76	III
4.	Scanner	83	02	168	1.68	IV
5.	Internet	100	00	200	2.00	I
6.	E-mail	100	00	200	2.00	I
7.	Digital Camera	97	03	197	1.97	II
8.	LCD Projector	74	00	148	1.48	V
9.	Interactive kiosk in class room	52	03	107	1.07	VI
10.	Mobile Phone/Telephone	100	00	200	2.00	I

While, majority of the respondents also had access to digital camera (97.00%), scanner (83.00%), photocopier (76.00) and LCD projector (74.00%) ranked 2nd, 3rd, 4th and 5th, respectively. However, internet kiosk ranked 6th with WMS 1.07.

4.3.1 Correlation and regression analysis of respondents' personal profile with accessibility of ICT services

Table 4.15 elaborates that education qualification and parental occupation had significant correlation with accessibility of ICT services, whereas other independent variables i.e. age, sex, job experience, rural-urban background, job preference, job satisfaction, job commitment, training and information seeking behavior do not show any significant association at 0.05 level of probability. While, in case of partial regression coefficient of faculty members with accessibility of ICTs only parental occupation was found significant.

Table 4.15: Correlation and regression analysis of respondents' personal profile with accessibility of ICT services**(n=100)**

Variable	Correlation Coefficient	Regression Coefficient	't' values
Age	-0.133 ^{NS}	-0.898	-0.935 ^{NS}
Sex	0.089 ^{NS}	0.753	0.690 ^{NS}
Education Qualification	-0.200*	-1.823	-1.918 ^{NS}
Job Experience	-0.119 ^{NS}	-0.030	-0.095 ^{NS}
Rural-Urban Background	0.093 ^{NS}	0.169	0.303 ^{NS}
Parental Occupation	0.238*	0.656	2.345*
Job Preference	0.096 ^{NS}	0.622	1.098 ^{NS}
Job satisfaction	-0.053 ^{NS}	0.071	0.705 ^{NS}
Job commitment	-0.030 ^{NS}	-0.030	-0.338 ^{NS}
Training	0.003 ^{NS}	0.750	1.011 ^{NS}
Information seeking behaviour	0.053 ^{NS}	0.149	0.825 ^{NS}

Dependent Variable: Accessibility of ICT facilities

*Significant at 5 per cent level

R²=0.143; Constant Value=16.150

However, age, sex, education qualification, job experience, rural-urban background, parental occupation, job preference, job satisfaction, training and information seeking behavior did not contributed to accessibility of ICTs with faculty members.

Further, it is concluded that 11 independent variables included in the study jointly contributed 14.00 per cent variation in the accessibility of ICTs with faculty members when other factor was kept constant. It means only 14.00 per cent of the variation in the dependent variables was due to these variables and remaining 86.00 per cent variation in the study due to other variables.

4.4 Usage pattern of ICT tools among faculty

4.4.1 Usage pattern of ICT tools for personal development

Examination of data presents in Table 4.16 that all of the faculty members utilize internet to search the general information (100.00%) and prepare SAR, CAS, progress and performance report etc. (100.00%).

Table 4.16: Usage pattern of ICT tools for personal development (n=100)

S. No.	Statements	Yes (F)	Yes (%)	No (F)	No (%)
1.	Internet to search the general information	100	100.00	00	0.00
2.	Acquire latest information related to domain	95	95.00	05	5.00
3.	Communicate with colleagues	93	93.00	07	7.00
4.	Online books, magazines, journals and articles etc.	96	96.00	04	4.00
5.	Prepare SAR, CAS, progress and performance reports etc.	100	100	04	4.00
6.	Apply for other post	69	69.00	31	31.00
7.	Social media for information and entertainment	78	78.00	22	22.00
8.	Develop and manage personal contact	82	82.00	18	18.00
9.	ICTs for social networking	81	81.00	19	19.00
10.	Online shopping	70	70.00	30	30.00

While, majority of the respondents use ICTs for accessing online books, magazines, journals and articles etc. (96.00%), acquire latest information related to domain (95.00%), communication with colleagues (93.00%), develop and manage personal contact (82.00%) and ICTs for social networking (81.00%). However, social media for information and entertainment, online shopping, and apply for other post is used 78.00, 70.00 and 69.00 per cent, respectively.

4.4.2 Usage pattern of ICT tools for teaching

The table 4.17 describes that majority of the respondents use ICTs for collection of course materials (98.00%) and online classes (98.00%), followed by giving assignments to students (97.00%), class room presentation (96.00%), preparation and submission of results (96.00%), online examination/evaluation (94.00%) and guiding P.G. students (90.00%). However,

question paper setting and take photographs of class is used only 87.00 and 71.00 per cent, respectively.

Table 4.17: Usage pattern of ICT tools for teaching (n=100)

S. No.	Statements	Yes (F)	Yes (%)	No (F)	No (%)
1.	Collection of course materials	98	98.00	02	02.00
2.	Online classes	98	98.00	02	02.00
3.	Class room presentation	96	96.00	04	04.00
4.	Assignment to students	97	97.00	03	03.00
5.	To take photographs of class	71	71.00	29	29.00
6.	Question paper setting	87	87.00	13	13.00
7.	Online examination/evaluation	94	94.00	06	06.00
8.	Preparation and submission of results	96	96.00	04	04.00
9.	Guiding PG students	90	90.00	10	10.00
10.	Students training and presentation	93	93.00	07	07.00

4.4.3 Usage pattern of ICT tools for research

Table 4.18 narrates that write research articles/policy paper etc. and submission of articles to journal/magazines is used 94.00 and 93.00 per cent, respectively. While, collect data about latest trend in research and presentation of results each is used 91.00 per cent by the faculty members. However, software/application for statistical analysis (90.00%), discussion/collaboration of lab/field work with other expert (89.00%), visiting different website for research grants (88.00%), attend meeting/workshop of funding agency (86.00%), prepare projects designs (84.00%) and prepare projects reports (83.00%) is used by the faculty members in case research purpose.

Table 4.18: Usage pattern of ICT tools for research (n=100)

S. No.	Statements	Yes (F)	Yes (%)	No (F)	No (%)
1.	Collect data about latest trend in research field	91	91.00	09	9.00
2.	Visiting different website for research grants	88	88.00	12	12.00
3.	Software/ application for statistical analysis	90	90.00	10	10.00
4.	Prepare projects designs	84	84.00	16	16.00
5.	Prepare projects reports	83	83.00	17	17.00
6.	Presentation of results	91	91.00	09	09.00
7.	Discussion/collaboration of lab/field work with other expert	89	89.00	11	11.00
8.	Attend meeting/workshop of funding agency	86	86.00	14	14.00
9.	Write research articles/policy paper etc.	94	94.00	06	06.00
10.	Submission of articles to journals/magazines	93	93.00	07	07.00

4.4.4 Usage pattern of ICT tools for extension

The data in Table 4.19 depicts that ICTs used for deliver expert lecture (87.00%), followed by video clips/ photographs for training/demonstration (72.00%), organize online trainings (71.00%), projector/interactive board for training/demonstration (69.00%), develop extension content for farmers (66.00%) and collect feedback from farmers (63.00%). However, mobile/camera for diagnostic purpose (60.00%), text/voice message to farmers, develops expert system and mobile application is used only 60.00, 45.00, and 41.00 per cent, respectively.

Table 4.19: Usage pattern of ICT tools for extension (n=100)

S. No.	Statements	Yes (F)	Yes (%)	No (F)	No (%)
1.	Text /voice message to farmers	53	53.00	47	47.00
2.	Video clips/photographs for training/demonstration	72	72.00	29	29.00
3.	Projector/ interactive board for training/demonstration	69	69.00	31	31.00
4.	To deliver expert lecture	87	87.00	13	13.00
5.	Mobile/camera for diagnostic purpose	60	60.00	40	40.00
6.	Organize online trainings	71	71.00	29	29.00
7.	To develop mobile application	41	41.00	59	59.00
8.	To develop expert system	45	45.00	55	55.00
9.	To develop extension content for farmers	66	66.00	34	34.00
10.	To collect feedback from farmers	63	63.00	37	37.00

4.4.5 Correlation and regression analysis of respondents' personal profile with usage pattern of ICTs

Table 4.20 describes that job commitment had positive and significant correlation with usage pattern of ICTs, whereas, age, sex, education qualification, training, job preference, parental occupation, rural-urban background, job satisfaction, job experience and information seeking behavior did not show any significant association at 0.05 level of probability. While, in case of partial regression coefficient of faculty members with utilization of ICTs only job commitment was found significant. However, age, sex, education qualification, job experience, rural-urban background, parental occupation, job preference, job satisfaction, training, and information seeking behavior did not contributed to utilization of ICTs with faculty members.

Further, it is concluded that 11 independent variables included in the study jointly contributed 11.00 per cent variation in the utilization of ICTs with faculty members when other factor was kept constant. It means only 11.00 per cent of the variation in the dependent variables was due to these variables and remaining 89.00 per cent variation in the study due to other variables.

Table 4.20: Correlation and regression analysis of respondents' personal profile with usage pattern of ICT tools (n=100)

Variable	Correlation Coefficient	Regression Coefficient	't' values
Age	-0.089 ^{NS}	-1.607	-0.813 ^{NS}
Sex	0.007 ^{NS}	1.135	0.690 ^{NS}
Education Qualification	-0.032 ^{NS}	-1.697	-0.858 ^{NS}
Job Experience	-0.057 ^{NS}	0.197	0.307 ^{NS}
Rural-Urban Background	-0.108 ^{NS}	-1.047	-0.857 ^{NS}
Parental Occupation	-0.031 ^{NS}	0.023	0.040 ^{NS}
Job Preference	-0.038 ^{NS}	-0.100	-0.085 ^{NS}
Job satisfaction	0.106 ^{NS}	0.047	0.229 ^{NS}
Job commitment	0.278*	0.411	2.278*
Training	0.033 ^{NS}	0.461	0.306 ^{NS}
Information seeking behaviour	0.152 ^{NS}	0.434	1.176 ^{NS}

Dependent Variable: Usage Pattern

*Significant at 5 per cent level

$R^2=0.118$; Constant Value=55.759

4.5 Constraints faced by the respondents in the using of ICTs

4.5.1 Personal constraints faced in using of ICTs

The table 4.21 shows that time management related to use of ICTs was found to be the major constraint ranked first with highest weighted mean score (WMS) 1.70, followed by shortage of time to spend on ICTs ranked second with WMS (1.64) and lack of expertise about the ICTs ranked third with WMS (1.56). However, not- user friendly programs and software and lack of confidence to use ICTs ranked fourth and fifth with WMS 1.47 and 1.43, respectively.

Table 4.21: Personal constraints faced in using of ICTs (n=100)

S. No.	Statements	Degree of Seriousness			TWS	WMS	Rank Order
		Very Serious	Serious	Not So Serious			
1.	Lack of expertise about ICTs	09	38	53	156	1.56	III
2.	Time management related to use of ICTs	22	48	41	170	1.70	I
3.	Shortage of time to spend on ICTs	07	50	43	164	1.64	II
4.	Lack of confidence to use ICTs	06	31	63	143	1.43	V
5.	Not user-friendly programs and software	07	34	59	147	1.47	IV

4.5.2 Technical constraints faced in using of ICTs

Table 4.22 describes the technical constraint, lack of technical personal to troubleshoot was found to be major constraint and ranked first with WMS 1.80, followed by high threat of virus, lack of ICTs training, and lack of technical knowledge regarding ICTs tools ranked second, third and fourth with WMS 1.77, 1.59 and 1.51, respectively. However, lack of internet facility at office ranked fifth constraint with WMS 1.47.

Table 4.22: Technical constraints faced in using of ICTs (n=100)

S. No.	Statements	Degree of Seriousness			TWS	WMS	Rank Order
		Very Serious	Serious	Not So Serious			
1.	Lack of internet facility in office	11	25	64	147	1.47	V
2.	Lack of technical knowledge regarding ICTs tools	9	33	58	151	1.51	IV
3.	Lack of ICTs training	13	33	54	159	1.59	III
4.	High threat of virus	16	45	39	177	1.77	II
5.	Lack of technical person to troubleshoot	21	38	41	180	1.80	I

4.5.3 Organizational constraints faced in using of ICTs

It is clear from Table 4.23 that fluctuation of internet and power was found to be major constraint and ranked first, followed by lack of frequently ICTs base training ranked second with WMS 1.67. While, lack of technical expertise in the institute, lack of fund provision to buy ICTs equipment and lack of basic and essential infrastructure ranked third, fourth and fifth with WMS 1.63, 1.54 and 1.46, respectively.

Table 4.23: Organizational constraints faced in using of ICTs (n=100)

S. No.	Statements	Degree of Seriousness			TWS	WMS	Rank Order
		Very Serious	Serious	Not So Serious			
1.	Lack of basic and essential infrastructure	08	31	61	146	1.46	V
2.	Lack of fund provision to buy ICTs equipment	11	32	57	154	1.54	IV
3.	Lack of technical expertise in the institute	11	42	47	163	1.63	III
4.	Fluctuation of internet and power	28	43	29	198	1.98	I
5.	Lack of frequently ICTs base training	11	47	42	167	1.67	II

4.5.4 Correlation and regression analysis of respondents' personal profile with constraints in the using of ICTs

Table 4.24 explains that job experience, job preference and information seeking behavior had significant correlation with constraints of ICTs, whereas age, sex, education qualification, training, parental occupation, rural-urban background and job satisfaction did not show any significant association at 0.05 level of probability. While, in case of partial regression coefficient of faculty members with constraints of ICTs only job commitment was found significant. However, age, sex, education qualification, job experience, rural-urban background, parental occupation, job preference, job satisfaction, training and information seeking behavior did not contributed to constraints of ICTs with faculty members.

Further, it is concluded that 11 independent variables included in the study jointly contributed 21.00 per cent variation in the constraints of ICTs with faculty members when other factor was kept constant. It means only 21.00 per cent of the variation in the dependent variables was due to these variables and remaining 79.00 per cent variation in the study due to other variables.

Table 4.24: Correlation and regression analysis of respondents' personal profile with constraints in the using of ICTs (n=100)

Variable	Correlation Coefficient	Regression Coefficient	't' values
Age	-0.163 ^{NS}	2.400	-0.813 ^{NS}
Sex	0.123 ^{NS}	-1.843	0.690 ^{NS}
Education Qualification	-0.032 ^{NS}	0.442	-0.858 ^{NS}
Job Experience	-0.242*	-1.297	0.307 ^{NS}
Rural-Urban Background	-0.056 ^{NS}	-0.846	-0.857 ^{NS}
Parental Occupation	-0.070 ^{NS}	0.972	0.0400 ^{NS}
Job Preference	0.256*	2.167	-0.085 ^{NS}
Job satisfaction	-0.029 ^{NS}	0.174	0.229 ^{NS}
Job commitment	-0.012 ^{NS}	0.029	2.278*
Training	-0.179 ^{NS}	-1.372	0.306 ^{NS}
Information seeking behaviour	-0.248*	-0.930	1.176 ^{NS}

Dependent Variable: Constraints

***Significant at 5 per cent level**

R²=0.214; Constant Value=31.804

This chapter presents the discussion regarding the findings of the study. For better comprehension the discussions have been presented under following sub-heads:

- 5.1 Profile of the respondents?
- 5.2 Availability of ICTs services among faculty
- 5.3 Accessibility of ICTs services among faculty
- 5.4 Usage pattern of ICT tools by the faculty
- 5.5 Constraints faced by the faculty in using of ICTs
- 5.6 Suggestions for effective utilization of ICTs

5.1 Profile of the respondents

This section comprises results of the study about the profile of the respondents with respect to independent variables i.e. age, sex, education qualification, rural-urban background, job experience, job preference, job satisfaction, job commitment, parental occupation, training received on ICTs and information seeking behavior.

5.1.1 Age

The results (Fig. 5.1) of the study revealed that more than half of respondents (51.00%) belonged to middle age group, followed by old age group (25.00%) and rest of the 24.00 per cent respondents belonged to the young age group. It can be concluded that most of the respondents (75.00%) belonged to productive age group in the university. Study got supports from the study of Zhang (2005) who reported that young age group was more confident to use ICTs.

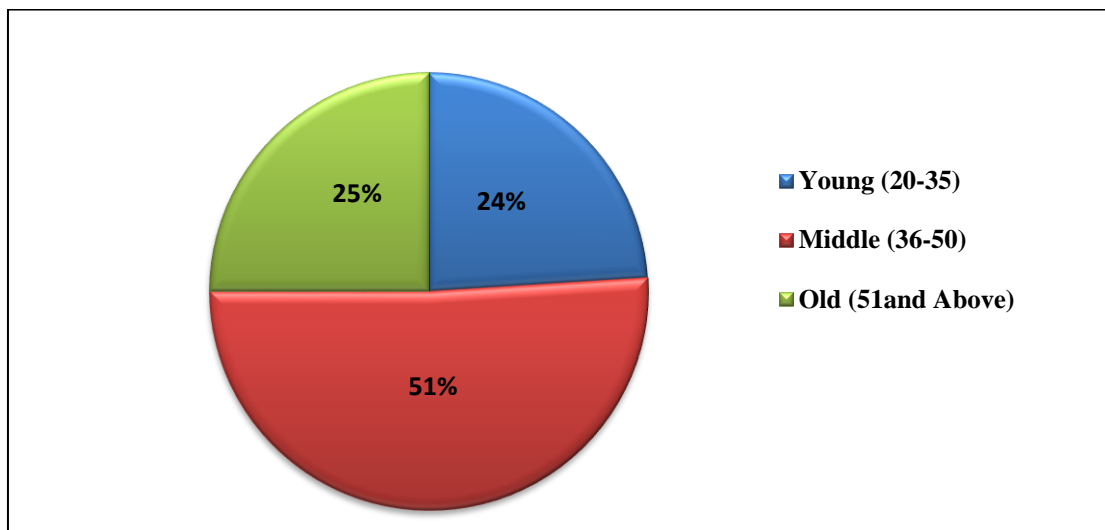


Fig. 5.1: Distribution of respondents on the basis of age

5.1.2 Sex

The study showed (Fig. 5.2) that more than half of the respondents belong to male (53.00%) and followed by the female group which is (47.00%). The results were in line with the study of Rehman *et. al.* (2017) who reported that male percentage was high than female.

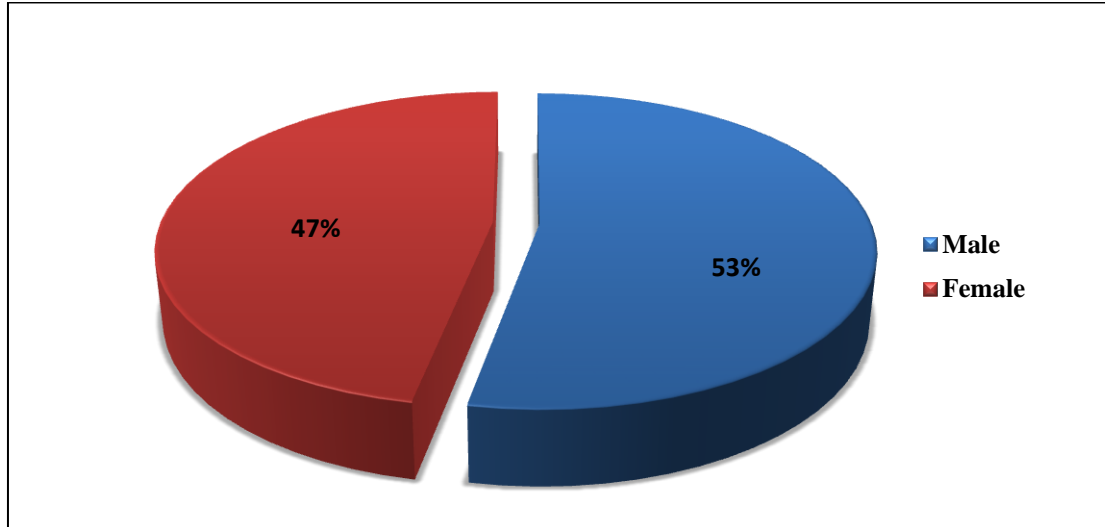


Fig. 5.2: Distribution of respondents on the basis of sex

5.1.3 Educational Qualification

It observed from Fig. 5.3 that most of the respondents were Ph. D (86.00%), followed by post-Doctorate (08.00%). The results got support from Zhang (2005) and Raksha and Meera (2015) who reported that education level affect the use of ICTs. Study also got support from Thomas and Parayil (2008) who reported that high educated category used more ICTs than other group.

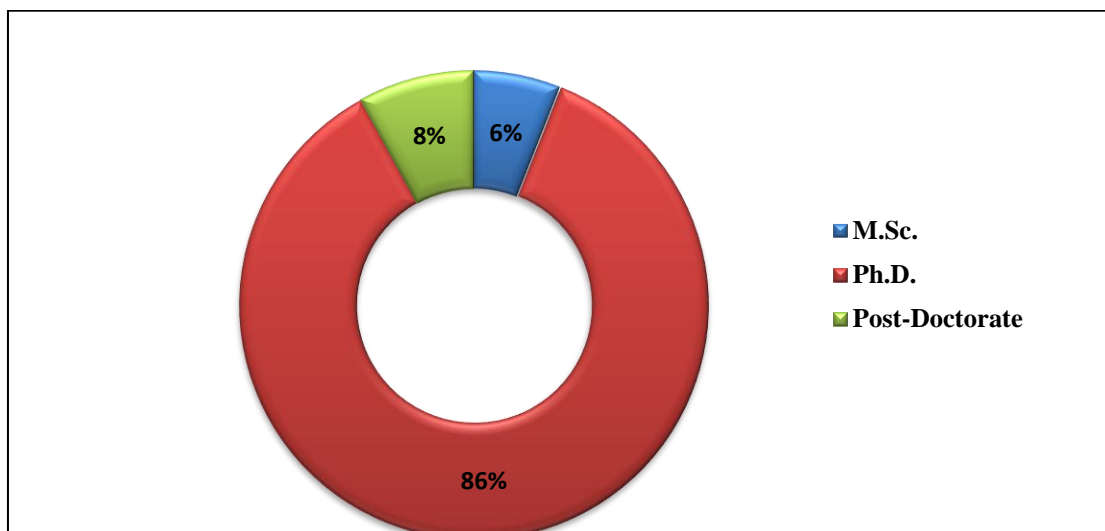


Fig. 5.3: Distribution of respondents on the basis of educational qualification

5.1.4 Job Experience

It was found in study (Fig. 5.4) that majority of respondents (28.00%) had a job experience up to 5 years, followed by 10-15 years (22.00%) and 5-10 years (18.00%).

Further, 15 per cent respondents had a job experience of 30-35 years, while another 8.00 per cent respondents had a job experience of 25-30 years. It can be concluded from the results that CCS HAU had a good combination of young faculty and experienced faculty.

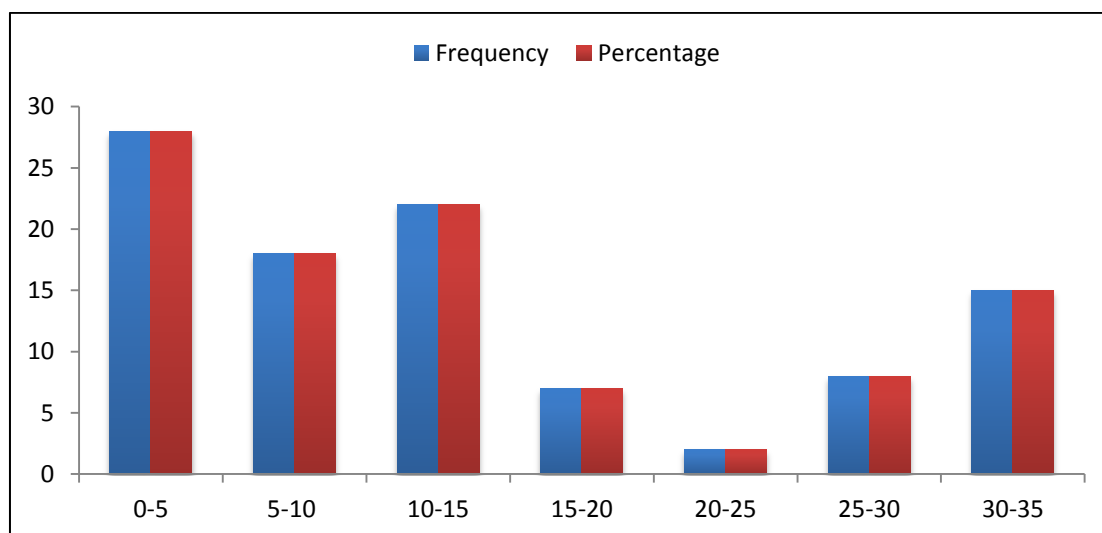


Fig. 5.4: Distribution of respondents on the basis of job experience

5.1.5 Rural-urban background

Fig. 5.5 showed that 50 per cent of the respondents had Urban background (48.00%), followed by rural background (40.00%). The study got strength from the findings of Jirapure (1991) who reported that maximum numbers of respondents were from urban-background.

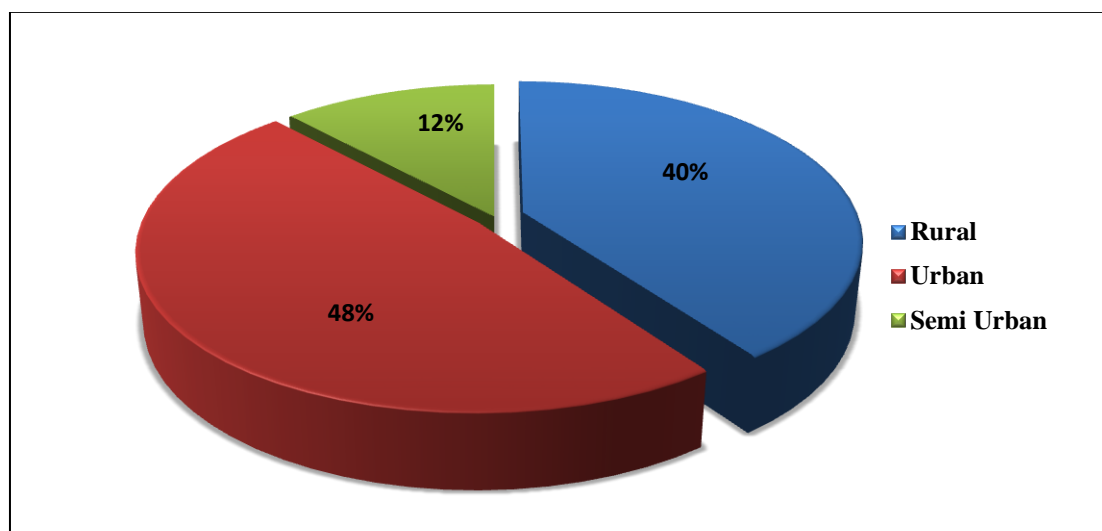


Fig. 5.5: Distribution of respondents on the basis of family background

5.1.6 Parental occupation

The results of the study presented in Fig. 5.6 that near two-third of the respondents parental occupation was service (64.00%), followed by farming (26.00%) and Labour (5.00%). Also 3.00 per cent of respondents parents were shopkeeper and 2.00 per cent of respondents' parents were businessman. Results showed that majority of the respondents parents were occupied in service and farming. It may be due to because more than half of the

respondents belong to urban and semi-urban area. Study partially got supports from the study of Singh *et. al.* (2014) who reported that main occupation was farming and service.

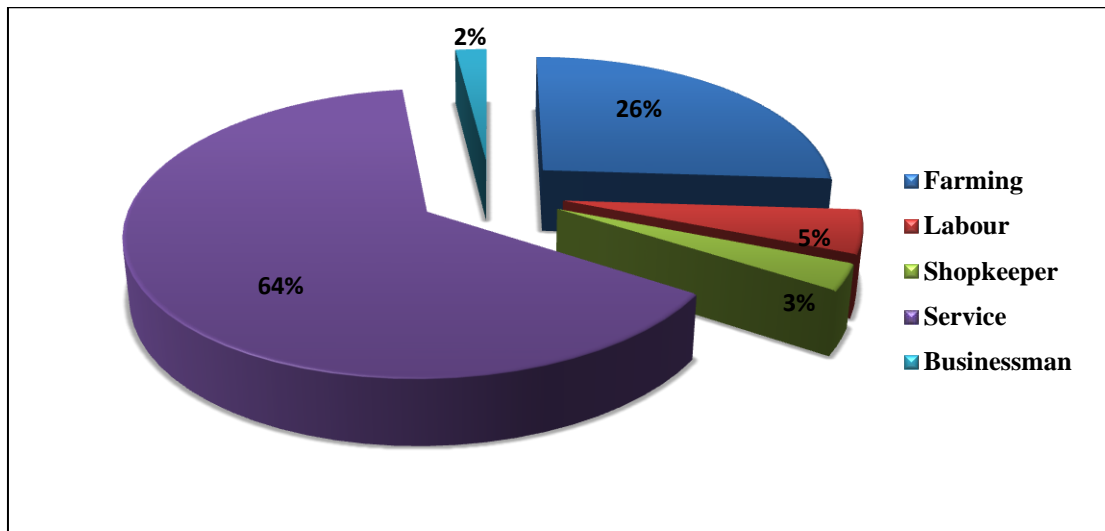


Fig. 5.6: Distribution of respondents on the basis of parental occupation

5.1.7 Job Preference

The study (Fig. 5.7) revealed that more than half of the respondents had teaching preference (58.00%), followed by the research (34.00%) and only 7.00 per cent of the respondents had extension preference.

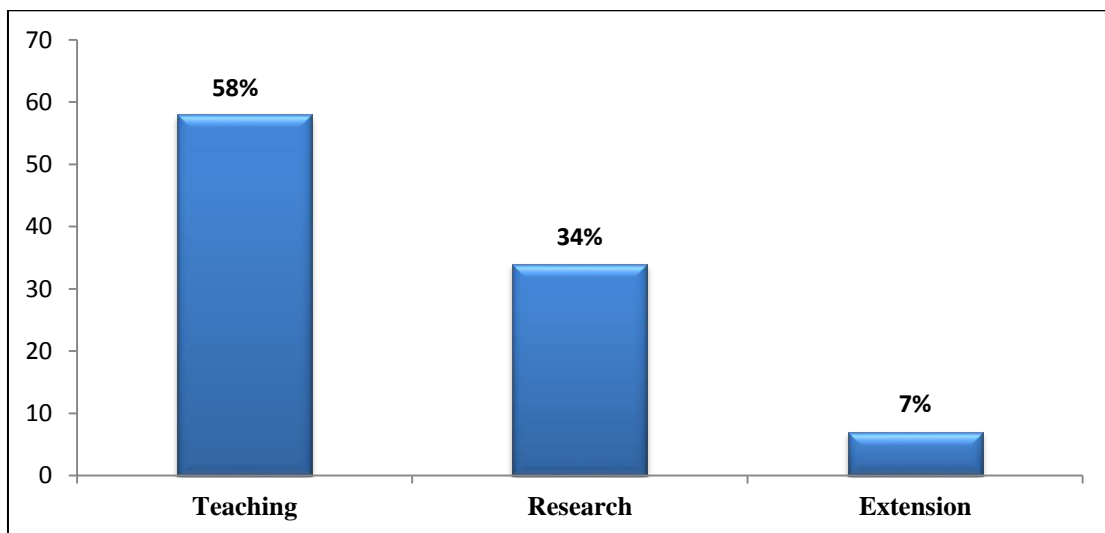


Fig. 5.7: Distribution of respondents on the basis of job preference

The findings may be due to the fact that the respondents selected in the studies were having job at main university campus and mainly involved in teaching and research. It can be concluded from the study that majority of the respondents (93.00%) prefer teaching and research and only a small number of faculty members were interested in extension

5.1.8 Job Satisfaction

Fig. 5.8 narrated that the most of respondents had medium level of job satisfaction (72.00%), followed by high level (18.00%) and low level (10.00%). Study showed that

majority of the respondents job satisfaction was medium to high. It may be due to job security, salary allowances and other career advancement scheme. Darko and Amanor (2016) also concluded that study relationship and facilities at work place leading the job satisfaction.

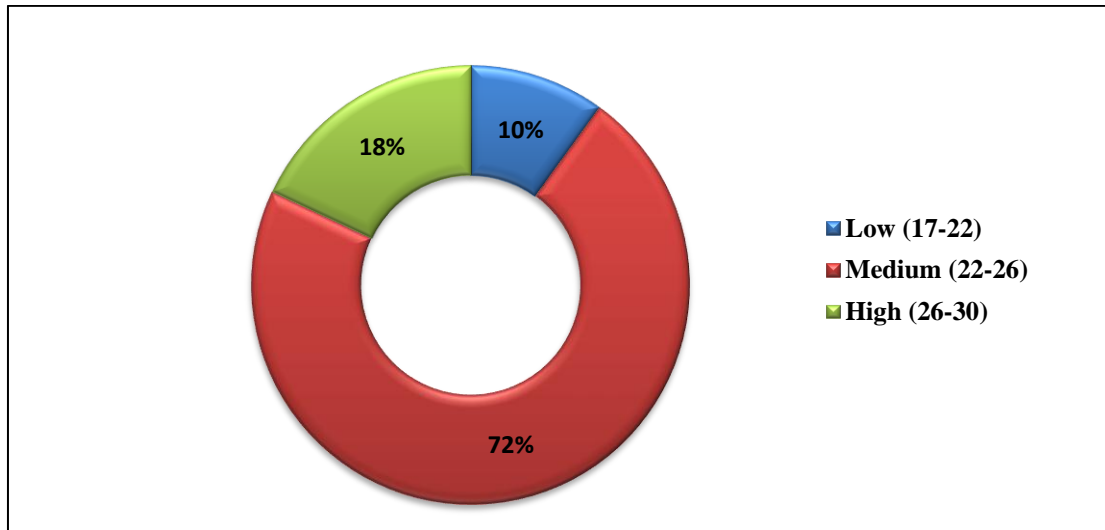


Fig. 5.8: Distribution of respondents on the basis of Job Satisfaction

5.1.9 Job Commitment

Fig. 5.9 described that more than two-third of the respondents had medium level of job commitment (70.00%), followed by low level (15.00%) and high level (15.00%), respectively. It can be concluded that majority of faculties had medium to high level of job commitment. University should make plan for the employees who fall in low commitment so that they will be more committed and accountable for their duties. The results also got supports from the result of Agha (2018) who revealed that most of the extension personnel were committed to their jobs.

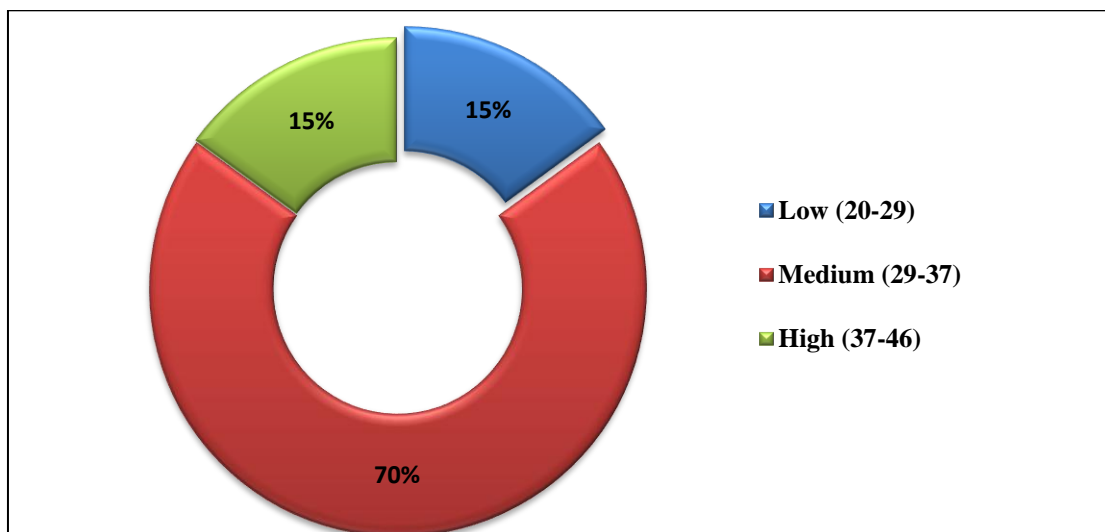


Fig. 5.9: Distribution of respondents on the basis of job commitment

5.1.10 Training received on ICTs

The study discovered in Fig. 5.10 that more than half of respondents (61.00%) received training on ICTs and 39.00 per cent did not receive training on ICTs. The results are in contrast to the findings of Agha (2018) who reported that 60 per cent extension personnel had not received any training. While, Egomo *et al.* (2012) suggested that government should organize training for all level of teachers. Whereas, Raksha and Meera (2015) concluded that agricultural extension system effected by training also.

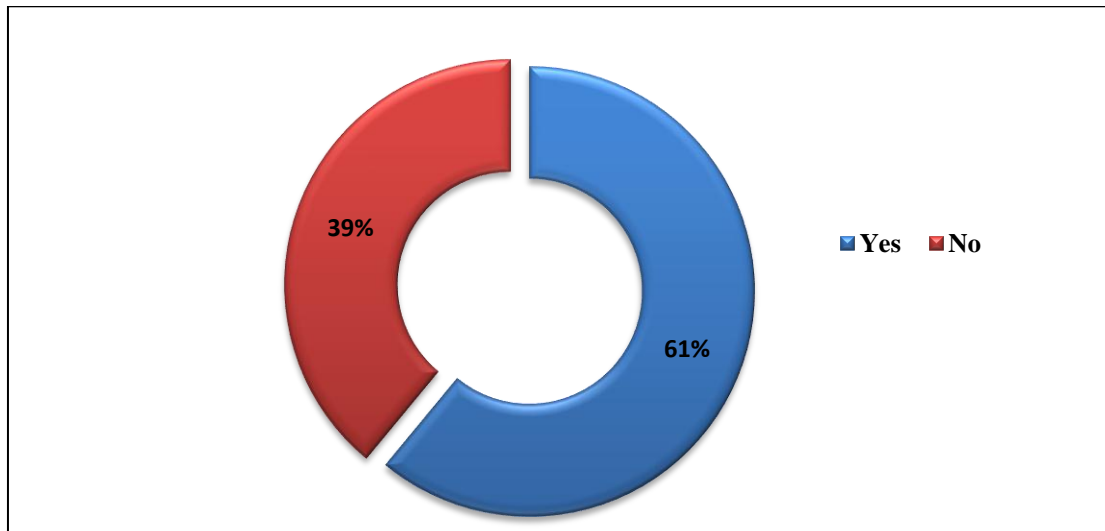


Fig. 5.10: Distribution of respondents on the basis of training received on ICTs

5.1.11 Information seeking behaviour

Fig. 5.11 depicted that respondents had medium level of information seeking behaviour (69.00%), followed by the low level (16.00%), while rest of the 15.00 per cent of the respondents had high level of information seeking behaviour. The results revealed that majority of respondents had medium to high level of information seeking behaviour.

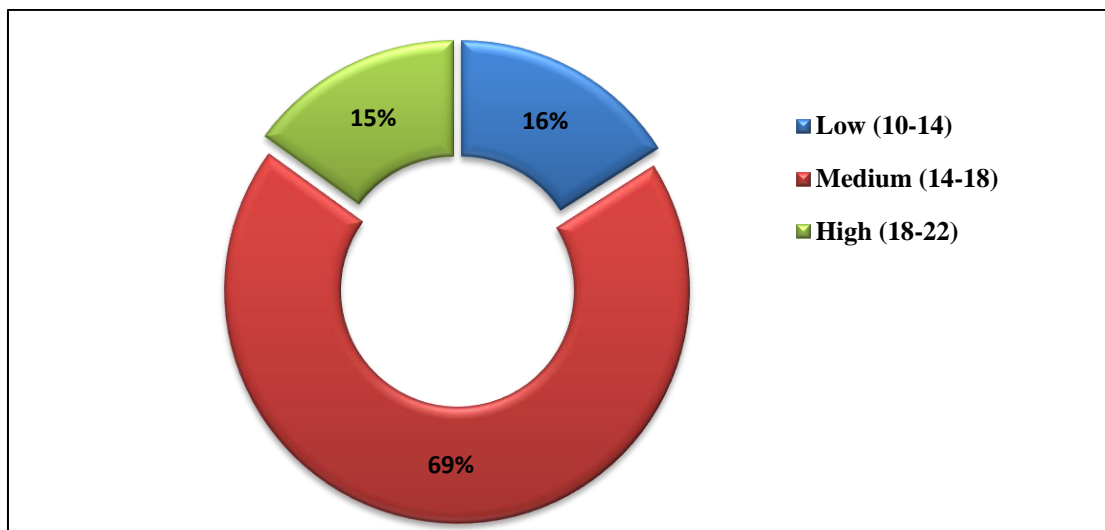


Fig. 5.11: Distribution of respondents on the basis of information seeking behaviour

5.2 Availability of ICTs services among faculty

The result recalled (Fig. 5.12) that all of respondents had ICT tools available i.e. computer/laptop, internet, e-mail, and mobile phone/ telephone. While majority of the respondents also had printer (97.00%), scanner (83.00%), LCD projector (74.00%) and photocopier (77.00%).

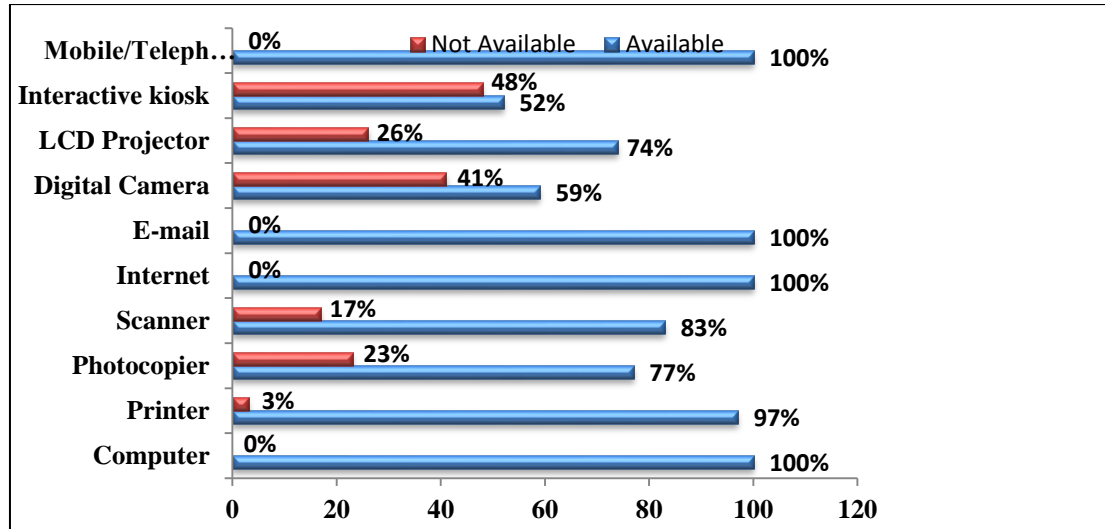


Fig. 5.12: Distribution of respondents on the basis of availability of ICTs services

Study concluded that faculty members have ICT tools except digital camera and interactive kiosk. University administration should take care about the information of interactive kiosk in class room and department library also. Study got strength from past research study of Bello *et. al.* (2013), Oriogu *et. al.* (2014), Samansiri and Wanigasundera (2014) and Gabadeen *et. al.* (2015) who reported that majority of ICT facilities were available for extension personnel, teachers and students. However, results are contradiction of the findings of Adedji (2011), Jude and Dankaro (2012) and Stephen (2013) who reported that ICT facilities were only for administration purpose and ICT resources were not available at college level.

5.2.1 Relationship between available ICT services and personality traits

Data presented the relationship between personality traits as independent variables and available ICT services as dependent variables. The traits selected in the study were age, sex, education qualification, rural-urban background, job experience, job preference, job satisfaction, job commitment, parental occupation, training received on ICTs and information seeking behavior correlation coefficient was computed to indicate the nature and extent of association and variation caused by these traits on available ICT services. Among the various attributes, job commitment had positive and significant correlation with available ICT services. These finding are in contrast of the findings of Malik *et. al.* (2020). While in case of the partial regression coefficient job commitment found to be significant.

5.3 Accessibility of ICTs services among respondents

The results (Fig. 5.13) in the study were found in the terms of accessibility of ICT services that all of the respondents have access to computer/laptop, printer, internet, e-mail and mobile phone/ telephone at department/office. While majority of the respondents also had access to digital camera, scanner, photocopier, LCD projector. However, accessibility of interactive kiosk was low among faculty members. University administration makes plan to increase the accessibility of ICT tools for faculty members in the campus.

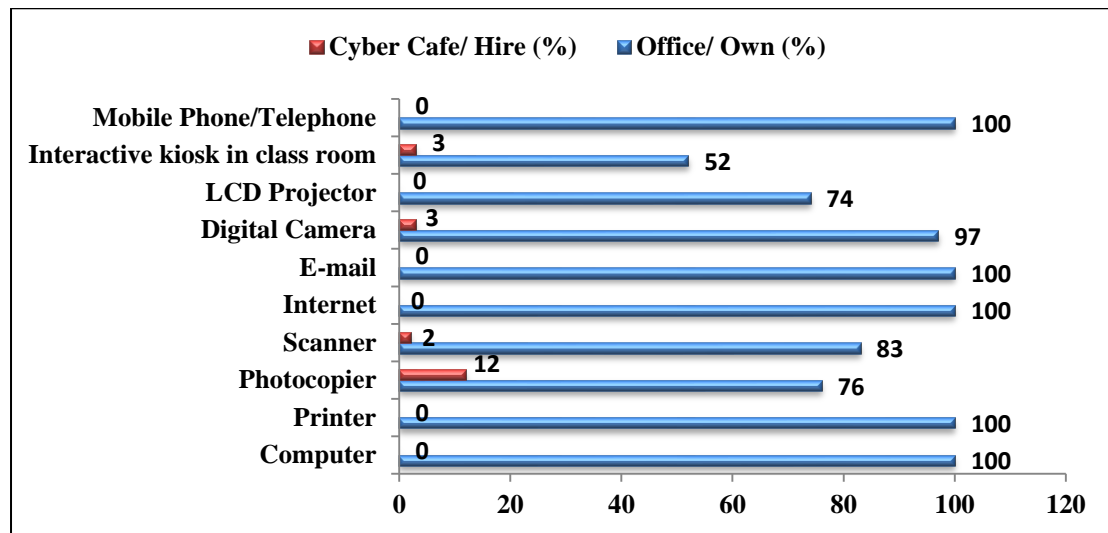


Fig. 5.13: Distribution of respondents on the basis of accessibility of ICT services

The findings are in agreement with the findings of Asemi (2005), and partially support from the study of Salau and Saingbe (2008) and Mugwisi *et. al.* (2017) who reported that faculty accessed internet and two-third extension personnel access the ICT services. The results are in contrast with the findings of Nazim and Saraf (2006); Agwu and Elizabeth (2013) and Tiwari *et. al.* (2014) who reported that modern ICT tools i.e. computer, internet and printer etc. were not accessible.

5.3.1 Relationship between accessibility of ICT services and personality traits

Data depicted the relationship between personality traits as independent variables and accessibility ICT services as dependent variables. The traits selected in the study were age, sex, education qualification, rural-urban background, job experience, job preference, job satisfaction, job commitment, parental occupation, training received on ICTs and information seeking behavior correlation coefficient was computed to indicate the nature and extent of association and variation caused by these traits on accessibility ICT services. Among the various attributes, education qualification and parental occupation had significant correlation with accessibility ICT facilities. These finding are in contrast of the findings of Malik *et. al.* (2020). While in case of the partial regression coefficient parental occupation and job commitment found to be significant.

5.4 Usage pattern of ICT tools by the respondents

5.4.1 Usage pattern of ICT tools for personal development

Fig. 5.14 presented that all of the faculty members utilize internet to search the general information (100.00%) and prepare SAR, CAS, progress and performance report etc. While, majority of the respondents use ICTs for accessing online books, magazines, journals and articles etc., acquire latest information related to domain, communication with colleagues, develop and manage personal contact, and ICTs for social networking. Utilization pattern of ICTs may be high due to availability of computer/laptop and internet to each faculty members. Study got support from research findings of Ansari (2006); Mooventhan (2006); Olatokun (2007); Parameshwar and Patil (2009); Chuhan (2010); Gore and Dawne (2016) and Malik *et. al.* (2021) who reported that ICT tools were used to find up-to-date information, communication with colleagues, social networking and personal development etc.

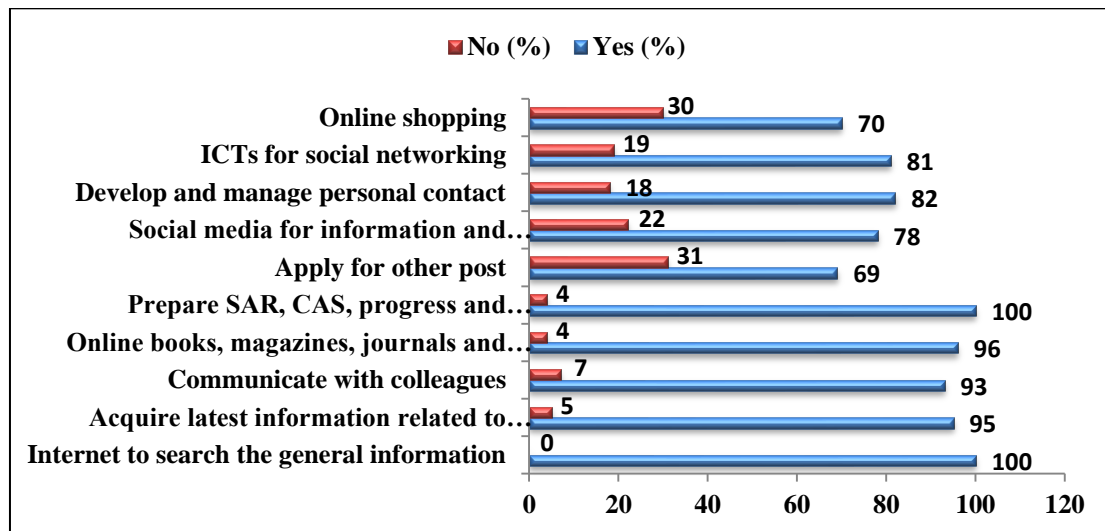


Fig. 5.14: Usage pattern of ICT tools for personal development

5.4.2. Usage pattern of ICT tools for teaching

Fig. 5.15described that majority of the respondents use ICTs for collection of course materials and online classes, followed by giving assignments to students, class room presentation, preparation and submission of results, online examination/evaluation, and guiding P.G. students. The classroom is now changing its look from black board to projector and interactive kiosks. It is the need of time to use ICT tools in class room to make teaching effective and productive. So, it may be reason of high utilization ICT tools by faculty members for teaching purpose. Another reason of utilization may be e-governance system of CCSHAU for faculty members to update attendance and marks on portal. Due to COVID-19 outbreak in the country teaching has been suspended and only e-learning is alternate for teaching, and ICT facilities also used for examination and evaluation also.

These findings derive the support from the study of Verma *et. al.* (2020) who reported that ICT resources were used in university for teaching purpose. While, Tunji *et. al.* (2011)

suggested that usage of electronic resources had positive impact in teaching. However, Ahmed (2015) concluded that male faculty members used ICT tools in teaching than female.

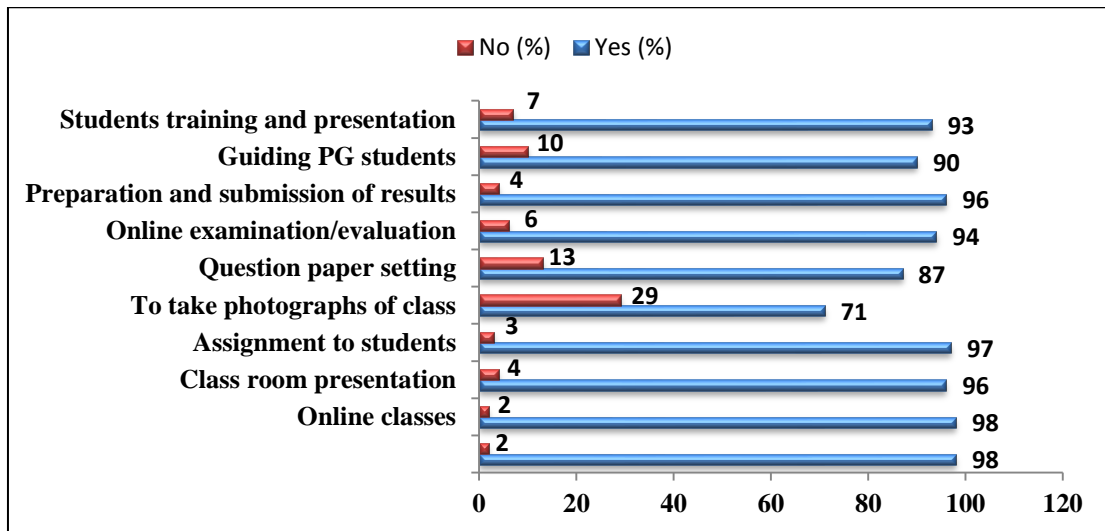


Fig. 5.15: Usage pattern of ICT tools for teaching

5.4.3 Usage pattern of ICT for research

Fig. 5.16 narrated that ICT tools are mainly used in write research articles/policy paper and submission of articles to journal/magazines. While, ICTS also used by the faculty members for collect data about latest trend in research and presentation of results, software/application for statistical analysis, discussion/collaboration of lab/field work with

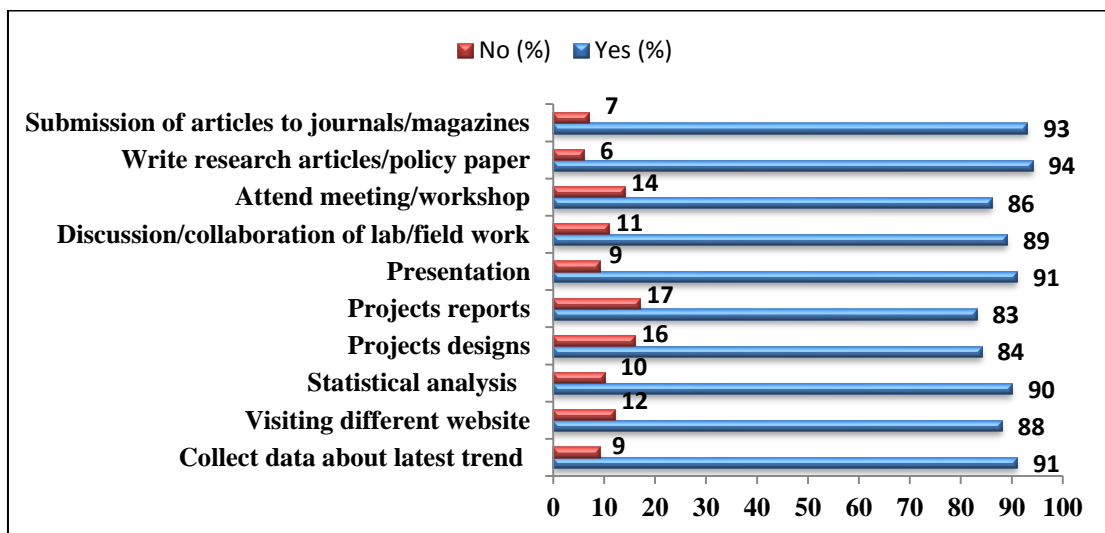


Fig. 5.16: Usage pattern of ICT tools for research

other expert, visiting different website for research grants, attend meeting/workshop of funding agency. High utilization of ICT tools in research is due to became everyday a researcher involves a number of activities i.e. latest trend in field, designing experiments, virtual visit of funding institutions, project design, analysis, results, report writing and research paper/articles publication etc.

Similar findings were observed by Madukwe (2006); Olatokun (2007); Tayade *et. al.* (2011) and Verma *et. al.* (2020) who reported that ICTs were used for data collection, processing, updating, analysis, printing and presentation. However, Cuban (2001); Agwu *et. al.* (2008); Salau and Saingbe (2018); Parameshwar and Fatil (2009) and Tanji concluded that ICT frequently used by researchers and had positive impact on research.

5.4.4 Usage pattern of ICT tools for extension

The data in Fig. 5.17 elaborated that ICTs used for deliver expert lecture, followed by video claps/ photographs for training/demonstration and organize online trainings. It can be inferred from the results that utilization of ICT for extension activities were not as popular as utilization for teaching and research. This can also be due to the fact that most of these faculties were employed in colleges as professors and scientists and were mainly concerned with teaching and research.

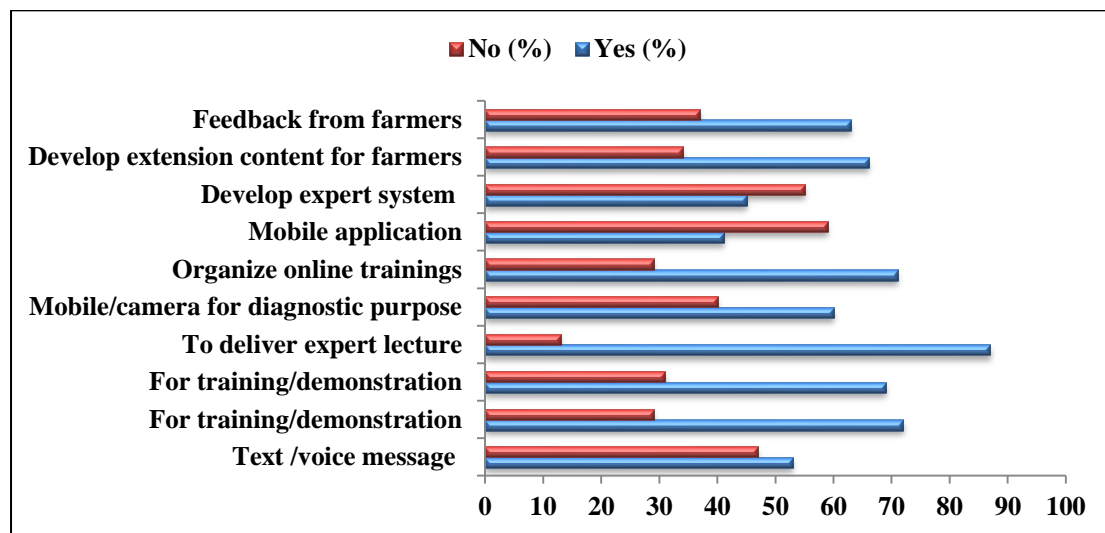


Fig. 5.17: Usage pattern of ICT tools for extension

The findings are consonance with the findings of Madukwe (2006); Salau and Saingbe (2008); Malik *et. al.* (2018) and Agha *et. al.* (2018) who reported that ICT tools use for agricultural extension purpose. However, Rohila *et. al.* (2017) suggested that ICT can play greater role in agricultural extension.

5.4.5 Relationship between usage of ICT tools and personality traits

Data depicted the relationship between personality traits as independent variables and utilization of ICT facilities as dependent variables. The traits selected in the study were age, sex, education qualification, rural-urban background, job experience, job preference, job satisfaction, job commitment, parental occupation, training received on ICTs and information seeking behavior correlation coefficient was computed to indicate the nature and extent of association and variation caused by these traits on available ICT facilities. Among the various attributes, job commitment had positive and significant correlation with available ICT

facilities. These findings are in contrast of the findings of Malik *et. al.* (2020). While in case of the partial regression coefficient job commitment found to be significant.

5.5 Constraints faced by the respondents in using of ICTs

5.5.1 Personal constraints faced in using of ICTs

It is cleared from Fig. 5.18 that the time management related to use of ICTs was major constraint ranked first, followed by shortage of time, lack of expertise about the ICTs, not user-friendly programs and software and lack of confidence to use ICTs. The results may be due to the fact that most of the faculty members in the different colleges had busy working schedule so that they face time constraint in the use of ICTs.

Present study got support from the result findings of Salau and Saingbe (2008); Omotesho *et. al.* (2012); Kale *et. al.* (2017); Anand *et. al.* (2020) and Raviya *et. al.* (2020) who reported that lack of computer expertise and knowledge were major constraints.

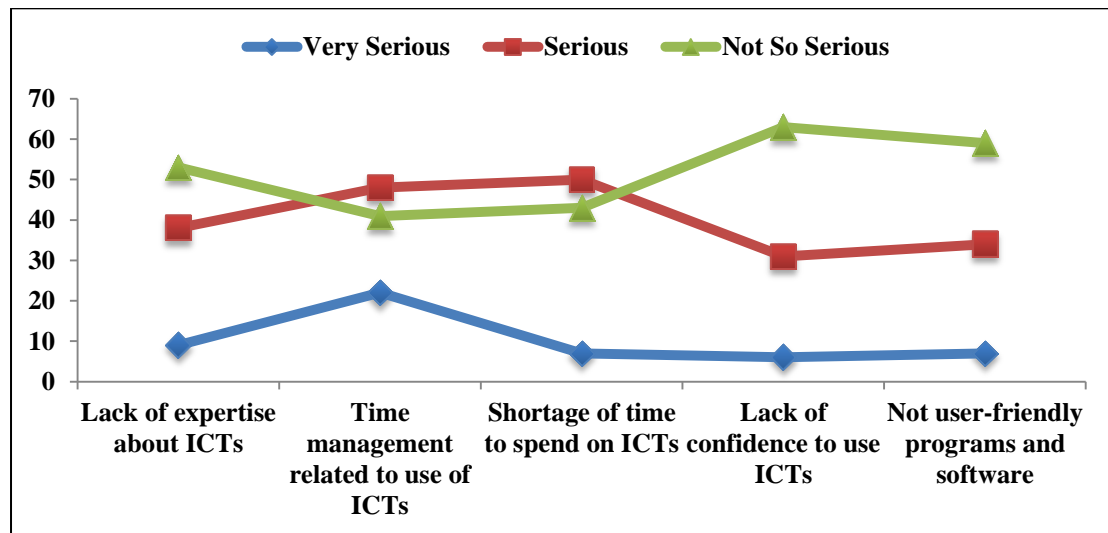


Fig. 5.18: Personal constraints faced in using of ICTs

5.5.2 Technical constraints faced in using of ICTs

Fig. 5.19 narrated that technical constraint i.e. lack of technical personal to troubleshoot was major constraint, followed by high threat of virus and lack of ICT training. However, lack of user-friendly programme and software, and lack of confidence to use ICTs were other constraints. The findings can be attributed to the fact that there might be shortage of technical persons to help out the faculty members in sorting various glitches in the functioning of ICT devices and rising threat of virus due to visiting on unsafe websites or using unprotected devices or lack of installation of anti-virus in computer/laptop.

The findings of the study are in consonance with the past study of Agwuet *et. al.* (2008); Agwu and Elizabeth (2013); Sireesha *et. al.* (2014); Ani *et. al.* (2016); Kale *et. al.* (2017); Agha *et. al.* (2018); Rohila *et.al.* (2019) and Ravigaet *et. al.* (2020) who reported that lack of technical person, lack of training and weak internet facility were major constraints.

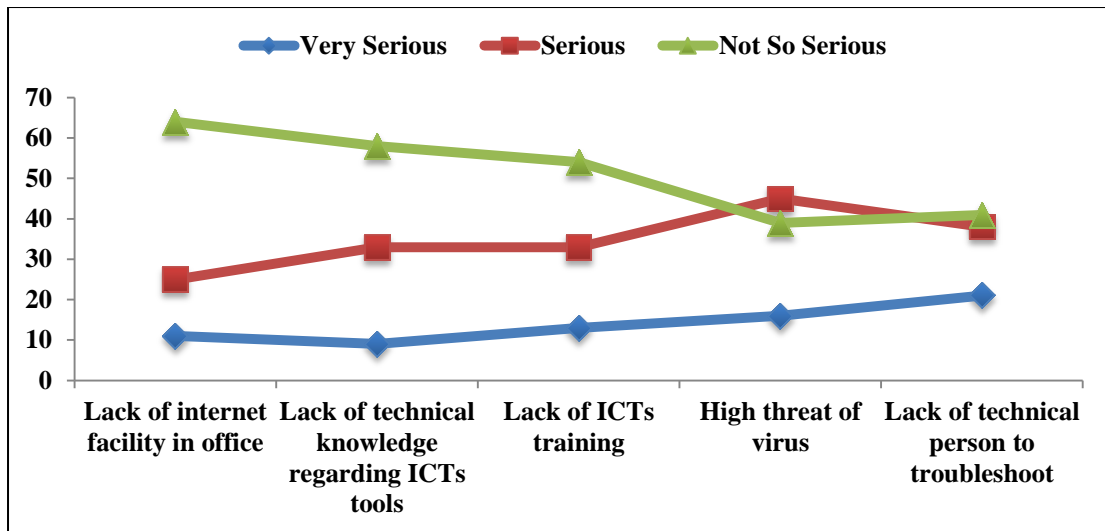


Fig. 5.19: Technical constraints faced in using of ICTs

5.5.3 Organizational constraints faced in using of ICTs

Fig. 5.20 clearly indicated that fluctuation of internet and power and lack of frequent ICT based training were major constraints, followed by lack of technical expertise, lack of fund provision to purchase ICT equipment and lack of basic and essential infrastructure were major constraints at organization level. The findings may be attributed to the fact that training programmes and skill up gradation for faculty members are organized frequently. Fluctuation may be due to large coverage and high numbers of faculty members in the campus.

The study got strength from the study of Roknuzzaman (2006) and Sireesha *et. al.* (2014) who reported that fluctuation of internet and power supply was major constraint. Study got partially support from Agwu *et. al.* (2008) and Anand *et. al.* (2020), whereas, study in contrast of findings of Adebaya and Adesope (2007), Salau and Saingbe (2008), Sireesha *et. al.* (2014) and Rohila *et. al.* (2019) who reported that no/ poor power supply of internet.

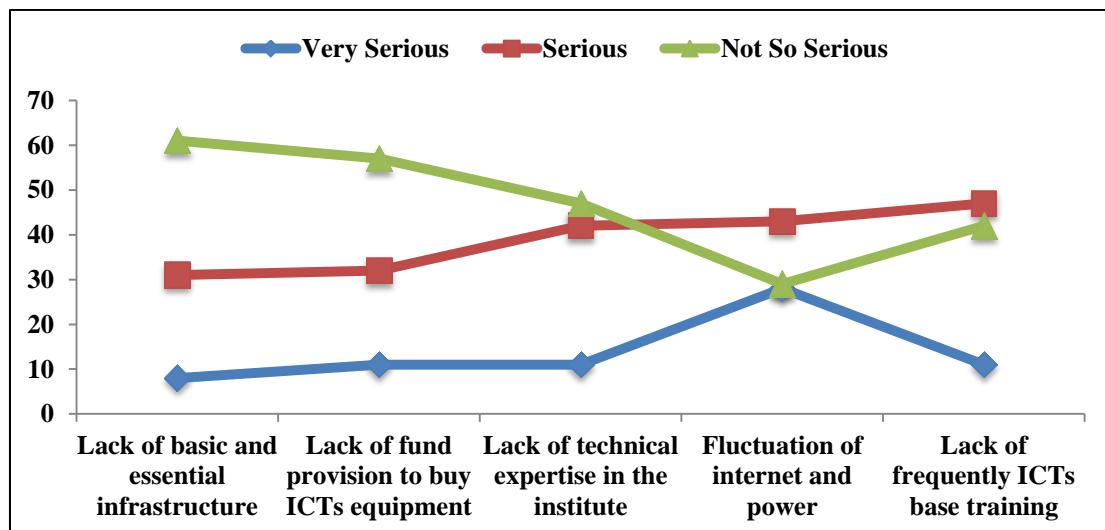


Fig. 5.20 : Organizational constraints faced in using of ICTs

5.5.4 Relationship between constraints and personality traits

Data described the relationship between personality traits as independent variables and constraints as dependent variables. The traits selected in the study were age, sex, education qualification, rural-urban background, job experience, job preference, job satisfaction, job commitment, parental occupation, training received on ICTs and information seeking behavior correlation coefficient was computed to indicate the nature and extent of association and variation caused by these traits on available ICT facilities. Among the various attributes, job experience, job preference and information seeking behavior had significant correlation with available ICT facilities. These findings are in contrast of the findings of Malik *et. al.* (2020). While in case of the partial regression coefficient job commitment found to be significant.

5.6 Suggestions for effective utilization of ICTs

- ICTs are important for teaching, research and extension. So all facilities related to ICTs should be available and accessible for faculty members.
- The University should organize regular training of faculty members to upgrade their knowledge and skills related to ICTs.
- Solution of fluctuation in power supply and internet connectivity with the help of proper planning.
- University should hire or recruited the new staffs so that they can provide solutions related to troubleshooting the ICTs.
- All faculty members should encourage making maximum utilization of ICTs in Teaching, Research and Extension activities.

CHAPTER-VI

SUMMARY AND CONCLUSION

World's current population rises from 7.4 to 7.9 billion by 2050, food production need to increase over this similar time. However, with the population growth rate 1.58 per cent, India is predicated to have more than 1.53 billion people by the end of 2030. Whereas, natural resources i.e. land and water are deterioration and degrading at a very fast rate. In this situation state Agricultural Universities i.e. CCSHAU, Hisar or agricultural research institutes can play important role to educate the farming communities and more focus on research in agricultural field. In these situations ICT tools can play an important role to disseminate the agricultural information to the farmers in very short time and ICTs may help to visit virtual the agricultural and research system of other states as well as nation. So, keeping the facts and importance of ICTs, the present study 'use of information and communication technologies (ICTs) among faculty members of CCSHAU, Hisar was proposed with following objectives:

1. To study the availability and accessibility of ICT services among faculty
2. To determine the usage pattern of ICT tools among faculty
3. To delineate the constraints faced by faculty in using ICTs

6.1 Research Methodology

The current research was carried out at the Chaudhary Charan Singh Haryana Agricultural University, Hisar. Four colleges (COA, COA&ET, COB&H and COH) were selected purposively for collection of data. Further, 25 faculty members were selected randomly from each selected college. Thus, a total of 100 faculty members were selected for the study. Data was collected with the help of well-structured questionnaire.

6.2 Profile of the respondents

- More than 50 per cent respondents were middle category (51.00%), followed by old category (25.00%).
- More than 50 per cent respondents were male (53.00%), followed by female (47.00%).
- Majority of the respondents were Ph.D. (86.00%), followed by Post- Doctorate (8.00%).
- About one-third of the faculty member had a job experience of up to 5 years (28.00%), followed by the 10-15 years (22.00%).
- About 50 per cent respondents were urban category (48.00%), followed by the rural category (40.00%).
- About two-third respondents parental occupation was services (64.00%), followed by the farming (26.00%).
- More than 50 per cent faculty members job preference was teaching (59.00%), followed by research (34.00%).

- More than two-third respondents had medium level of job satisfaction (72.00%), followed by high level (18.00%).
- More than two-third faculty member had medium level of job commitment (70.00%), followed by low and high level each 15 per cent.
- Most of the faculty members (61.00%) received training on ICTs.
- More than two-third respondents had medium level of information seeking behaviour (69.00%), followed by the low level (16.00%).

6.3 Availability and accessibility of ICT services among faculty

- All of the respondents had computer/laptop, internet, e-mail and mobile phone/telephone facilities and available with them.
- Majority of the respondents had printer and scanner.
- All of the respondents have access to computer/laptop, printer, internet, e-mail and mobile phone.
- Majority of respondents had access to digital camera and scanner.
- Job commitment was found to be significantly and positively correlated with availability of ICTs, however, education qualification was found to have negatively and significant correlation with accessibility of ICTs. While, parental occupation was found positive and significant correlation.

6.4 Usage pattern of ICT tools among faculty

- All of the respondents utilize ICT for general information and to prepare SAR, CAS, progress and performance reports etc.
- Majority of respondents use ICTs for personal development i.e. online books, magazines, journals and articles etc., acquire latest information related to domain and communicate with colleagues.
- Majority of the respondents use ICTs for teaching i.e. collection of course materials, online classes, assignment to students, class room presentation, preparation and submission of results, online examination/evaluation, students training and presentation, guiding PG students, and question paper setting.
- Majority of the respondents use ICTs for research i.e. write research articles/policy paper etc., submission of articles to journals/magazines, presentation of results, collect data about latest trend in research field, software/application for statistical analysis, discussion/collaboration of lab/field work with other expert, visiting different website for research grants, attend meeting/workshop of funding agency, and prepare projects designs.
- Majority of respondents use ICTs for extension i.e. to deliver expert lecture.
- Job commitment was found to be positively and significantly correlated with utilization pattern of ICTs.

6.5 Constraints faced by faculty in using ICTs

- Time management related to use of ICT was major constraints, followed by shortage of time to spend on ICTs.
- Lack of technical person to troubleshoot was major constraints, followed by high threat of virus.
- Fluctuation of internet and power was the major constraints, followed by lack of frequently ICTs base training.
- Job experience and information seeking behaviour was to be negatively and significantly correlated with constraints in the use of ICTs, while job preference was to be found positive and significantly correlated with coefficient.

6.6 Conclusion

Present study concluded that majority of the faculty members had available all ICT services and all were accessible. University administration should make plan to install interactive kiosks in the campus; moreover, there is need of smart class room for teaching purpose. Majority of the respondents used ICT tools for personal development, teaching and research, while utilization of ICT tools was quite low in extension activities as compare to others. University administration should emphasize on the problems which are faced by faculty members in using ICTs. Moreover, the action plane may be more effective to encounter the constraints must be implemented as soon as possible in campus.

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**DEPARTMENT OF EXTENSION EDUCATION
CCS HARYANA AGRICULTURAL UNIVERSITY, HISAR - 125004**

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Admission No: 2019A62M

Use of information and communication technologies (ICTs) among faculty of CCS Haryana Agricultural University, Hisar.

ANNEXURE-I

S. No. _____ Mobile No. _____
Name (Dr./Mr./Ms.): _____ Designation: _____
Department: _____ College: _____

1. Age

S. No.	Particulars	Score
1.	Young (20-35)	1
2.	Middle (36-50)	2
3.	Old (51 and Above)	3

2. Sex:

S. No.	Particulars	Score
1.	Male	1
2.	Female	2

3. Education Qualification:

S. No.	Particulars	Score
1.	M.Sc.	1
2.	Ph.D.	2
3.	Post-Doctorate	3

4. Job Experience (in years):

S. No.	Particulars	Score
1.	0-5	1
2.	5-10	2
3.	10-15	3
4.	15-20	4
5.	20-25	5
6.	25-30	6
7.	30-35	7
8.	35-40	8

5. Rural-Urban Background:

S. No.	Particulars	Score
1.	Rural	1
2.	Urban	2
3.	Semi Urban	3

6. Parental Occupation:

S. No.	Particulars	Score
1.	Farming	1
2.	Labour	2
3.	Shopkeeper	3
4.	Service	4
5.	Businessman	5

7. Job Preference:

S. No.	Particulars	Score
1.	Teaching	1
2.	Research	2
3.	Extension	3

8. Job satisfaction:

S. No.	Particulars	Highly Satisfied (3)	Satisfied (2)	Not Satisfied (1)
1.	Job security			
2.	Salary and other allowances			
3.	Career advancement scheme			
4.	Status attached to the job			
5.	Interpersonal relationship			
6.	Physical facilities available			
7.	Freedom to express idea			
8.	House/office accommodation			
9.	Opportunity for development			
10.	Recognition and reward			

9. Job commitment:

S. No.	Particulars	SA	A	N	D	SD
	For positive statements	5	4	3	2	1
	For negative statements	1	2	3	4	5
1.	I always reach at office timely					
2.	Stay late in office for other assigned job					
3.	Ready to accept any other assignment for university					
4.	My and university values are very similar					
5.	Proud to tell others that I am part of CCSHAU					
6.	CCSHAU inspires for better job performance.					
7.	I am extremely glad that I chose this university for job					
8.	Deciding to work for this university was a definite mistake on my part					
9.	Your job commitment affects other work					
10.	Any Other (Please Specify)					

*SA-Strongly Agree; A-Agree; N-Neutral; D-Disagree and SD-Strongly Disagree

10. Training:

Particulars	Yes (2)	No (1)
Training received on ICTs		

11. Information seeking behavior:

S. No.	Particulars	Regularly (3)	Occasionally (2)	Never (1)
1.	Friends and relatives			
2.	Radio/ Television			
3.	Internet			
4.	Print media			
5.	Social Media			
6.	Magazine			
7.	Any other (Please Specify)			

ANNEXURE-II**1. Availability of ICT services:**

S. No.	Particulars	Available (2)	Not Available (1)
1.	Computer		
2.	Printer		
3.	Photocopier		
4.	Scanner		
5.	Internet		
6.	E-mail		
7.	Digital Camera		
8.	LCD Projector		
9.	Interactive kiosk		
10.	Mobile/ Telephone		

2. Accessibility of ICT services:

S. No.	Particulars	Office (3)	Own (2)	Cyber Cafe/Hire (1)
1.	Computer			
2.	Printer			
3.	Photocopier			
4.	Scanner			
5.	Internet			
6.	E-mail			
7.	Digital Camera			
8.	LCD Projector			
9.	Interactive kiosk			
10.	Mobile/ Telephone			

3. Usage pattern of ICT tools:

Usage pattern of ICT tools for personal development

S. No.	Statements	Yes (2)	No (1)
1.	Internet to search the general information		
2.	Acquire latest information related to domain		
3.	Communicate with colleagues		
4.	Online books, magazines, journals and articles etc.		
5.	Prepare SAR, CAS, progress and performance reports etc.		
6.	Apply for other post		
7.	Social media for information and entertainment		
8.	Develop and manage personal content		
9.	ICTs for social networking		
10.	Online shopping		

Usage pattern of ICT tools for teaching:

S. No.	Statements	Yes (2)	No (1)
1.	Collection of course materials		
2.	Online classes		
3.	Class room presentation		
4.	Assignment to students		
5.	To take photographs of class		
6.	Question paper setting		
7.	Online examination/evaluation		
8.	Preparation and submission of results		
9.	Guiding PG students		
10.	Students training and presentation		

Usage pattern of ICT tools for research:

S. No.	Statements	Yes (2)	No (1)
1.	Collect data about latest trend in research field		
2.	Visiting different website for research grants		
3.	Software/ application for statistical analysis		
4.	Prepare projects designs		
5.	Prepare projects reports		
6.	Presentation of results		
7.	Discussion/collaboration of lab/field work with other expert		
8.	Attend meeting/workshop of funding agency		
9.	Write research articles/policy paper etc.		
10.	Submission of articles to journals/magazines		

Usage pattern of ICT tools for extension

S. No.	Statements	Yes (2)	No (1)
1.	Text /voice message to farmers		
2.	Video clips/photographs for training/demonstration		
3.	Projector/ interactive board for training/demonstration		
4.	To deliver expert lecture		
5.	Mobile/camera for diagnostic purpose		
6.	Organize online trainings		
7.	To develop mobile application		
8.	To develop expert system		
9.	To develop extension content for farmers		
10.	To collect feedback from farmers		

4. Constraints faced in using of ICTs:

S. No.	Statements	Degree of Seriousness		
		Very Serious (3)	Serious (2)	Not So Serious (1)
Personal constraints				
1.	Lack of expertise about ICTs			
2.	Time management related to use of ICTs			
3.	Shortage of time to spend on ICTs			
4.	Lack of confidence to use ICTs			
5.	Not user friendly programs and software			
Technical constraints				
1.	Lack of internet facility in office			
2.	Lack of technical knowledge regarding ICTs tools			
3.	Lack of ICTs training			
4.	High threat of virus			
5.	Lack of technical person to troubleshoot			
Organizational constraints				
1.	Lack of basic and essential infrastructure			
2.	Lack of fund provision to buy ICTs equipment			
3.	Lack of technical expertise in the institute			
4.	Fluctuation of internet and power			
5.	Lack of frequently ICTs base training			

ABSTRACT

Title of thesis	:	Use of information and communication technologies (ICTs) among faculty of CCS Haryana Agricultural University, Hisar.
Full Name of degree holder	:	Mr. ZiaulhaqHaqyar (2019A62M)
Title of Degree	:	Master of Science in Extension Education
Name and address of Major Advisor	:	Dr. A. K. Rohila (Assistant Professor) CCS Haryana Agricultural University Extension Education Institute, Nilokheri Karnal-132 117, Haryana (India) E-mail ID: rohillaextension@gmail.com
Degree awarding University	:	CCS Haryana Agricultural University, Hisar (Haryana) India
Year of award of degree	:	2021
Major subject	:	Extension Education
Total number of pages in the thesis	:	46 + v + V
Number of words in the abstract	:	204

Key words: Constraints, education, ICT, research, teaching and utilization

The current research was carried out at the CCS Haryana Agricultural University, Hisar. Four colleges were selected purposively for collection of data. Further, 25 faculty members were selected randomly from each selected college. Thus, a total of 100 faculty members were selected for the study. Data was collected with the help of well-structured questionnaire. Majority of respondents (75.00%) belonged to productive age group and acquired high education. More than two-third of the respondents experience was up to 15 years and parental occupation was service, followed by farming. More than fifty per cent respondent interested in teaching and respondents received training on ICTs also. Most of the respondents belonged to middle category in case of job, satisfaction, job commitment and information seeking behaviour. Study concluded that majority of the faculty members had available all ICT services and all were accessible. However, usage pattern of ICTs was low as compare to other activities i.e. personal, teaching and research. Present study also concluded that time management related to use of ICT, shortage of time to spend on ICTs, lack of technical person to troubleshoot, high threat of virus, fluctuation of internet and power, and lack of frequently ICTs base training were major constraints in using of ICTs.

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I, **Ziaulhaq Haqyar**, Admission No. **2019A62M**, hereby undertakes that I give the full copyrights of my thesis entitled “**Use of information and communication technologies (ICTs) among faculty of CCS Haryana Agricultural University, Hisar**” to the Chaudhary Charan Singh Haryana Agricultural University, Hisar.

I also undertake that the patent, if any, arising out of the research work conducted during the programme shall be filed by me only with due permission with the competent authority of Chaudhary Charan Singh Haryana Agricultural University, Hisar.

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