EXTENT OF INFORMATION COMMUNICATION TECHNOLOGY

[ICT] UTILIZATION BY THE FACULTY MEMBERS

IN STATE AGRICULTURAL UNIVERSITIES

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ABSTRACT

Information and Communication Technology (ICT) in agricultural education has paramount importance to bring reality to the teaching- learning process. In spite of committed efforts, the utilization of ICT tools in agricultural education is still not reaching the expectations of the stakeholders. Ample numbers of ICT tools were also been regularly designed and refined to suit the teaching-learning process in agricultural education. But the focus on the valid gaps for underutilization of ICTs has not been made by the researchers in the agricultural education system. To explore such gaps and to bring a modest approach to the faculty members to learn and efficiently utilize the ICT in their teaching endeavor, the present study was taken up under ICAR extramural research project during 2016-17 with the objective of assessing the extent of utilization of ICT by the faculty members in the State Agricultural Universities. The study revealed that there was 35.08 per cent awareness 29.45 per cent of accessibility 26.47 percent of knowledge, 23.38 per cent of application proficiency and 22.28 per cent of the frequency of usage by the faculty members on all ICTs. Highest utilization of ICTs was under Tools and Peripherals followed by Programs, Web Browsers and Search Engine, Personal Mails, Online Transactions and other components. Nearly half of the faculty members had a moderate extent of ICT utilization followed by less and extent of ICT utilization. Under 'tools and Peripherals', Computer, Printer and Pendrive; under 'Web Browsers and Search Engines', Google, Google Chrome and Microsoft Internet; under programs Microsoft Office, Adobe Reader and File explorer; under 'Personal Mails' Gmail, Yahoo mail and Rediff mail; under social networking sites Facebook, Youtube and Whatsapp were the top three ICTs used by the faculty members. Among the different academic activities, the ICTs were majorly used for Enrichment of subject knowledge, a collection of course materials, Class Room Presentation and other activities by the faculty members in SAUs.

KEYWORDS: Information and Communication Technology, Utilization, Agricultural Education, State Agricultural University & Faculty members

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INTRODUCTION

Information and Communication Technology (ICT) in agricultural education has paramount importance to bring reality to the teaching-learning process. A great deal of research has proven the benefits to the quality of education (Al-Ansari, 2006). ICTs have the potential to innovate, accelerate, enrich, and deepen skills, to motivate the students (Davis and Tearle, 1999; Lemke and Coughlin, 1998; cited by Yusuf, 2005). Various kinds of ICT products are available and having relevance to education, such as teleconferencing, email, audio conferencing,

television lessons, radio broadcasts, interactive radio counseling, interactive voice response system, audiocassettes and CD ROMs etc., have been used in education for different purposes (Sharma, 2003; Bhattacharya and Sharma, 2007). Cholin (2005) and Suku and Pillai (2005) revealed that the universities in India are at various stages of development in the application of Information and Communication Technology tools in their day-to-day activities. The field of education has been affected by ICTs, which have undoubtedly affected teaching, learning, and research (Yusuf, 2005). As Jhurreev (2005) states, much have been said and reported about the impact of technology, especially computers, in education. As a consequence, the use of ICT will not only enhance learning environments, but also prepares the next generation for future lives and careers (Wheeler, 2001). A changed pool of teachers will come with changed responsibilities and skill sets for future teaching involving high levels of ICT and the need for more facilitative than didactic teaching roles (Littlejohn et al., 2002). ICTs are making dynamic changes in society. They provide opportunities in adapting learning and teaching to individual needs. Tinio (2002), states the potentials of ICTs in increasing access and improving relevance and quality of education in developing countries.

However, research studies show that most teachers do not make use of the potential of ICT to contribute to the quality of learning environments, although they value this potentially quite significantly (Smeets, 2005). In spite of committed efforts, the utilization of ICT tools in agricultural education is still not reaching the expectations of the stakeholders. Jeevan and Nair (2004) reported that the problems faced in ICT adoption included inadequacy of funds, shortage of IT skilled manpower, difficulties in periodic up-gradation of infrastructural facilities, frequent change and advancement of technology, high hardware and software costs, insufficient training of professionals and absence of hands-on training. Ample numbers of ICT tools were also been regularly designed and refined to suit the teaching-learning process in the agricultural education. But the focus on the validity gaps for underutilization of ICTs has not been made by the researchers in agricultural education system. Walmiki and Ramakrishnegowda (2009) revealed that most of the universities lack sufficient hardware and software facilities, and internet with the required bandwidth to exploit the benefits of the digital information environment. Kannappanavar and Vijayakumar, (2001) observed that, though the agricultural university is having hardware and software facilities to some extent, the results are not reaching the clientele. It recommends that the faculty should be trained on IT application. To explore such gaps and to bring a modest approach to the faculty members to learn and efficiently utilize the ICT in their teaching endeavor, the present study was taken up under the ICAR extramural research project during the year 2016-17 with the objective of assessing the extent of utilization of ICT by the faculty members in the State Agricultural Universities.

MATERIALS AND METHODS

The study was conducted in Southern India covering Andhra Pradesh, Telangana, Karnataka and Tamil Nadu states by using Ex-post facto research design. Two State Agricultural Universities (SAUs) from each of the selected four states were selected and thus making a total of eight SAUs. Two Colleges from each SAU were selected and thus making a total of sixteen colleges. Thirty faculty members were selected from each of the selected colleges thus makes a total of four hundred and eighty (480) faculty members as respondents. A well-structured data collection questionnaire was prepared according to the objective of the study.

Assessment of the extent of utilization of ICT by the faculty members of different state agricultural universities was measured with the help of tool consisting of 193 ICTs included in the schedule categorized under 12 major subheads Viz. tools and peripherals, programs, web browsers and search engines, personal emails, apps, file sharing, websites related

to agricultural education, databases, social networking sites, conferencing, short messages services and online transactions. All these ICTS were measured through six (6) important criteria Viz., awareness, accessibility, knowledge, application proficiency, the frequency of use and duration of years.

Awareness was measured on a two-point continuum namely 'yes' and 'no' with a scores of 1 and 0 respectively. Accessibility was measured on a two-point continuum namely 'yes' and 'no' with a scores of 1 and 0 respectively. Knowledge was measured on a five-point continuum *i.e.* very high, high, medium, less and very less with scores of 5, 4, 3, 2 and 1 respectively. Application Proficiency was measured on a five-point continuum viz. very high, high, medium, less and very less with scores of 5, 4, 3, 2 and 1 respectively. A Frequency of use was measured on a five-point continuum viz. daily, weekly, monthly, half-yearly, yearly with scores of 5, 4, 3, 2 and 1 respectively. A weightage of '1' was given to each completed year to compute ICT utilization by the faculty members to measure the duration of years. Faculty members were also asked to mention the significant ICT methodologies adopted for these core activities to measure the extent of ICT utilization in handling different "Activities" pertaining to Academics. A total of 14 core activities pertaining to academics in agricultural education were identified by consulting faculty members and the same was measured in terms of the extent of ICT utilization on a 5 point continuum from highest to lowest by giving scores of 5, 4, 3, 2, 1 respectively. The data collected from all the respondents were coded and tabulated. Then the data were subjected to different statistical tests such as Percentage, Mean and Standard Deviation. The findings emerged out of the data analysis were interpreted, discussed and necessary inferences and conclusions were drawn.

RESULTS AND DISCUSSIONS

The results of the study were presented under five sub heads viz., Extent of awareness, accessibility, knowledge, application proficiency and frequency of use of ICTs by the faculty members, Distribution of Faculty members based on their overall extent of ICT utilization, Ranking of different components of ICT's based on Index score of extent of ICT utilization by the faculty members, Ranking of top three items in each component of different ICT's and Extent of ICT utilization in handling different "Activities" pertaining to academics by the Faculty members in State Agricultural Universities (SAU's)

Extent of Awareness, Accessibility, Knowledge, Application Proficiency and Frequency of use of ICTs by the Faculty Members

Presented in table 1 and figure 1. The overall extent of utilization of ICT by the Faculty members revealed that 35.08 per cent awareness on all ICTs was noticed followed by 29.45 per cent accessibility to all ICTs, possession of knowledge (26.47%), the frequency of use (22.28%) and application proficiency (23.38%) on all ICTs. As the hardware components, 'Tools & peripherals' have shown more than fifty percent of utilization. Whereas for the 'programs' and other software related components, the faculty was less exposed and not utilizing such ICTs. On the other side web browsers & search engines, personal emails, online transaction, social networking there has been about twenty-five percent of utilization due to their day to day requirements. About 78.62 per cent awareness was observed regarding 'Tools and Peripherals' followed by 'Online Transactions' (54.94%), 'Programs' (47.30%), 'Web Browsers and Search Engines' (42.95%), 'Personal Mails' (36.46%), 'Social Networking Sites' (35.01%), 'Apps' (29.50%), 'Websites related to Agricultural Education' (25.17%), 'Databases' (21.97%), 'File Sharing' (19.62%), 'Conferencing' (15.32%) and 'Short Messages Services' (14.17%).

Table 1: Extent of Awareness, Accessibility, Knowledge, Application Proficiency and Frequency of use of ICTs by the Faculty Members

S. No.	Components of Information and Communication Technology (ICT)	Awareness	Accessibility	Knowledge	Application Proficiency	Frequency of Use
		(%)	(%)	(%)	(%)	(%)
1	Tools and Peripherals	78.62	63.98	58.00	55.57	55.12
2	Programs	47.30	41.75	37.00	35.08	33.70
3	Web Browsers and Search Engines	42.95	37.93	34.00	32.63	31.14
4	Personal Mails	36.46	30.38	28.66	27.69	25.81
5	Apps	29.50	24.41	22.00	21.11	19.22
6	File Sharing	19.62	16.32	17.00	16.38	15.18
7	Websites Related to Agricultural Education	25.17	23.85	19.00	18.13	16.33
8	Databases	21.97	16.65	16.00	15.32	13.83
9	Social Networking Sites	35.01	29.22	25.00	24.20	22.24
10	Conferencing	15.32	13.53	14.00	13.49	11.69
11	Short Messages Services	14.17	12.29	14.00	12.83	11.42
12	Online Transactions	54.94	43.20	33.00	30.02	24.92
	Overall Information and Communication Technology (ICT)	35.08	29.45	26.47	22.28	23.38

Accessibility for 'Tools and Peripherals' was about 63.98 per cent followed by 'Online Transactions' (43.20%), 'Programs' (41.75%), 'Web Browsers and Search Engines' (37.93%), 'Personal Mails' (30.38%), 'Social Networking Sites' (29.22%), both 'Websites related to Agricultural Education' and 'Apps' (23.85%), 'Databases' (16.65%), 'File Sharing' (16.32%), 'Conferencing' (13.53%) and 'Short Messages Services' (12.29%). Knowledge towards 'Tools and Peripherals' was about 58.00 per cent followed by 'Programs' (37.00%), 'Web Browsers and Search Engines' (34.00%), 'Online Transactions' (33.00%), 'Personal Mails' (28.66%), 'Social Networking Sites' (25.00%), 'Apps' (22.00%), 'Websites related to Agricultural Education' (19.00%), 'File Sharing' (17.00%), 'Databases' (16.00%) and both 'Conferencing' and 'Short Messages Services' (14.00%).

Application Proficiency towards 'Tools and Peripherals' was about 55.57 per cent followed by 'Programs' (35.08%), 'Web Browsers and Search Engines' (32.63%), 'Online Transactions' (30.02%), 'Personal Mails' (27.69%), 'Social Networking Sites' (24.20%), 'Apps' (21.11%), 'Websites related to Agricultural Education' (18.13%), 'File Sharing' (16.38%), 'Databases' (15.32%), 'Conferencing' (13.49%) and 'Short Messages Services' (12.83%). Frequency of use of 'Tools and Peripherals' was about 55.12 per cent followed by 'Programs' (33.70%), 'Web Browsers and Search Engines' (31.14%), 'Personal Mails' (25.81%), 'Online Transactions' (24.92%), 'Social Networking Sites' (22.24%), 'Apps' (19.22%), 'Websites related to Agril. Education' (16.33%), 'File Sharing' (15.18%), 'Databases' (13.83%), 'Conferencing' (11.69%) and 'Short Messages Services' (11.42%).

The programs are mandatory to operate computers and faculty might be using different programs to handle their day to day academic activities so about 33 percent of utilization was observed for programs. Even though, all other components such as apps, file sharing, websites, databases, conferencing and SMS contribute significantly to their profession, because of lack of awareness and accessibility they were almost negligible in use among the faculty members. Lack of awareness of ICT itself is the major limitation to move ahead with ICT in Agricultural Education. Due to their busy academic schedules, the faculty might be unaware of the latest updates in the ICT domain. Accordingly, it is also noticed that there was only about thirty percent access to different ICTs to the faculty members which retain their skill

under dark about ICT's. Being a teacher, they might be enthusiastic to learn and acquire skills about the ICT's for which they are aware & access and use in their day to day activities. The above trend is an indication for poor awareness & accessibility leading to further utilization ICT by the faculty members. It is also clearly noticed that, the majority of the components were blocked at awareness & accessibility stage itself and shown very poor knowledge, application proficiency frequency of use.

Distribution of Faculty Members in State Agricultural Universities (SAUs) by their Overall Extent of ICT Utilization

Distribution of Faculty members in State Agricultural Universities (SAUs) by their overall extent of ICT utilization is depicted in the table 2 and figure 2. It is clearly noticed from table 2 and figure 2 that nearly half (45.00%) of the faculty members had a moderate extent of ICT utilization.

Table 2: Distribution of Faculty Members by their Overall Extent of ICT Utilization

S. NO.	Extent of ICT Utilization	N	%	Mean	S.D.
1	Less	163	34.00	4811.49	4616.45
2	Moderate	215	45.00		
3	High	102	21.00		
	Total	480	100		

About thirty four per cent of them had less and twenty one per cent of them had a high extent of ICT utilization respectively. This is an indication that there is every scope to enhance the ICT utilization agricultural education as three fourth of the faculty members were under low to medium level of ICT utilization.

Ranking of Different Components of ICT's Based on Index Score of Extent of ICT Utilization by Faculty Members

A perusal of the table 3 and figure 4 explicitly depicted that, among the different components of ICT's based on extent of ICT utilization by faculty members, Tools and Peripherals (11.99%) ranked first, followed by Web Browsers and Search Engines (6.01%), Programs (5.89%), Personal Mails (4.81%), Social Networking Sites (2.05%) were ranked as second, third, fourth and fifth respectively. Online Transactions (1.90%), Apps (1.88%), Websites Related to Agricultural Education (1.74%), Databases (1.23%), File Sharing (1.08%), Conferencing (0.72%), Short Messages Services (0.65%) occupied sixth, seventh, eighth, ninth and tenth, eleventh and twelfth ranks respectively.

Table 3: Ranking of Different Components of ICT's Based on Index Score of Extent of ICT Utilization by Faculty Members

S. No.	Components of Information Communication Technology (ICT)	Extent of Utilization Score (Sum)	Extent of Utilization Score (Avg)	Extent of Utilization Index Score (%)	Rank
1	Tools and Peripherals	935476	35980	11.99	I
2	Web Browsers and Search Engines	306356	18021	6.01	II
3	Programs	158817	14438	5.89	III
4	Personal Mails	116569	6135	4.81	IV
5	Social Networking Sites	62826	5711	2.05	V
6	Online Transactions	388954	17680	1.90	VI
7	Apps	57415	5220	1.88	VII
8	Websites related to agril. Education	42008	3231	1.74	VIII
9	Databases	11765	1961	1.23	IX

Table 3: Contd.,					
10	File Sharing	118161	5627	1.08	X
11	Conferencing	77432	3687	0.72	XI
12	Short Messages Services	32510	2167	0.65	XII

The Index is a pointer to show the status of an entity. In the present study, the index score of different ICT components depicts the extent of utilization by the faculty members. From the results, it can be interpreted that, tools & peripherals might be known to the faculty and they might be practically experiencing such tools. On the other side web browsers, programs and personal emails might be used by the faculty as and when required for their day to day activities. The other ICT components were under very meager use of the faculty members. This reflects the very scanty use of ICT by the faculty members.

Ranking Of Top Three Items in Each Component of Different Information Communication Technology (Ict's)

The table 4 depicted the top three ICTs under each component based on the extent of ICT utilization by faculty members. Under 'tools and Peripherals' component, 'Printer' followed by 'Computer' and 'Pen drive' where the top three ICTs with an average score of 29.26, 29.13 and 27.66 respectively. With regards to 'Web Browsers and Search Engines', 'Google' was ranked first, followed by 'Google Chrome' and 'Microsoft Internet Explorer' with averages of 18.66, 17.14 and 16.85 respectively. 'Microsoft Office', 'Adobe reader' and 'File Explorer' were ranked successively, first, second and third in the program's component with an average of 26.07, 16.39 and 13.09 respectively. With regards to 'Personal Mails', 'Gmail', 'Yahoo mail' and 'Rediff mail' were ranked in the order of first with an average of 17.02, second with an average of 15.75 and third with an average of 11.97.

In case of social networking sites 'Facebook' with an average of 7.48 was ranked first ,followed by 'Youtube' with and average of 7.03 and 'Whatsapp' with an average of 6.28. 'Flipkart', 'Amazon' and 'Snapdeal' were ranked first, second and third with an average of 3.98, 3.46 and 3.25 respectively for 'online transactions'.

Table 4: Ranking of Top Three Items in Each Component of Different Information Communication Technology (ICT's) Based on the Extent of ICT Utilization by Faculty Members

S. No.	Information Communication Technology (ICT)	Extent of Utilization Score(Sum)	Extent of Utilization Score (Average)	Extent of Utilization Score (%)	Rank
A.	Tools and Peripherals				
1	Printer	87784	3376	29.26	I
2	Computer	87390	3361	29.13	II
3	Pen drive	82986	3192	27.66	III
B.	Web Browsers and Search Engines				
1	Google	55992	3294	18.66	I
2	Google Chrome	51423	3025	17.14	II
3	Microsoft Internet Explorer	50563	2974	16.85	III
C.	Programs				
1	Microsoft Office	78207	3555	26.07	I
2	Adobe Reader	49184	2236	16.39	II
3	File Explorer	39255	1784	13.09	III
D.	Personal Mails				
1	G-mail	51066	4642	17.02	I
2	Yahoo mail	47247	4295	15.75	II

Table 4: Contd.,					
3	Rediffmail	35919	3265	11.97	III
E.	Social Networking Sites				
1	Facebook	22431	1181	7.48	I
2	You tube	21088	1110	7.03	II
3	Whatsapp	18825	991	6.28	III
F.	Online Transactions				
1	Flipkart	11940	1085	3.98	I
2	Amazon	10368	943	3.46	II
3	Snapdeal	9763	888	3.25	III
G.	Apps				
1	Google maps	17291	823	5.76	I
2	Grammar check	16082	766	5.36	II
3	Dictionaries	13685	652	4.56	III
H.	Websites Related to Agril. Education				
1	www.icar.org.in	26140	2376	8.71	I
2	www.ecourses.iasri.res.in	6578	598	2.19	II
3	www.agriculturaleducation.org	6059	551	2.02	III
I.	Databases				
1	Springer	13161	627	4.39	I
2	Science direct	12226	582	4.08	II
3	Cabi	11235	535	3.75	III
J.	File Sharing				
1	Wiki classrooms / Wikipedia	17359	1335	5.79	I
2	Share it	9731	749	3.24	II
3	Slide share	6315	486	2.11	III
K.	Conferencing				
1	Skype	11439	763	3.81	I
2	Yahoo messenger	9870	658	3.29	II
3	Google hangout/ Google talk	6452	430	2.15	III
L.	Short Messages Services				
1	Way2sms	7924	1321	2.64	I
2	160by2	1762	294	0.59	II
3	sms440	969	162	0.32	III

With regards to ‘Apps’, ‘Google maps’, ‘Grammar check’ and ‘Dictionaries’ are ranked successively in the order of first, second and third with an average of 5.76, 5.36 and 4.56. ‘Web sites related to Agricultural Education’ items ranked first, second, third were ‘www.icar.org.in’ with 8.71, ‘www.ecourses.iasri.res.in’ with 2.19 and ‘www.agriculturaleducation.org’ with 2.02. With regards to ‘Springer’, ‘Science direct’ and ‘Cabi databases’ were ranked first, second and third successively with an average of 4.39, 4.08 and 3.75 respectively. Wiki classrooms / Wikipedia’ with an average of 5.79, ‘Share it’ with an average of 3.24 and ‘Slide share’ with an average of 2.11 were ranked in the order from first to third for the component of file sharing in ICT. ‘Skype’, ‘Yahoo messenger’ and ‘Google hangout/ Google talk’ were ranked in order successively in the ‘Conferencing’ component of ICT with an average of 3.81, 3.29 and 2.15 respectively. In the component of ‘Short Messages Services’, ‘Way2sms’, ‘160by2’, ‘sms440’ items were ranked first, second and third with an average of 2.64, 0.59 and 0.32 respectively.

Extent of ICT Utilization in Handling Different “Activities” Pertaining to Academics by the Faculty Members in State Agricultural Universities (SAU’s)

It is clearly evident from table 5 and figure 5 that ICT Utilization by the faculty members in State Agricultural Universities (SAU’s) for different academic activities in the rank order from first to fourteen successively were for the

Enrichment of subject knowledge (78.29%) followed by collection of course materials (76.88%), Class Room Presentation (74.33%), Giving Assignments to Students (69.38%), Preparation of grade sheets/ performance Registers (68.00%), Paper Setting (64.71%), Guidance for PG &Ph.D. Students (63.00%), Preparing the Students for Competitive Exams (62.88%), Practical's / Field Visits to Students (58.33%), Handling of projects (58.00%), Student advisory (56.42%), Attending extra and co-curricular activities (56.33%), Conducting Examinations (55.44%) and Evaluation of examination papers (46.13%). The faculty might have given importance for ICT to acquire knowledge as well as a collection of course material as these two are the critical incidents in teaching.

Table 5: Ranking of Different Academic Activities Based on Utilization of ICT by the Faculty Members

S. No.	Academic Activity	Weighted Sum	Per cent Utilization of ICT	Rank
1	Enrichment of subject knowledge	1879	78.29	I
2	Collection of Course Materials	1845	76.88	II
3	Class Room Presentation	1784	74.33	III
4	Giving Assignments to Students	1665	69.38	IV
5	Preparation of grade sheets/ performance Registers	1632	68.00	V
6	Paper Setting	1553	64.71	VI
7	Guidance for PG &Ph.D Students	1512	63.00	VII
8	Preparing the Students for Competitive Exams	1509	62.88	VIII
9	Practical's / Field Visits to Students	1400	58.33	IX
10	Handling of projects	1392	58.00	X
11	Student advisory	1354	56.42	XI
12	Attending extra and co-curricular activities	1352	56.33	XII
13	Conducting Examinations	1333	55.54	XIII
14	Evaluation of examination papers	1107	46.13	XIV

Simultaneously they also might be preparing attractive audio-visual aids by using ICT to present the topic to the students further they might be exploring the latest information by giving the assignment to students. This technique not only enriches the knowledge of the student, but also helps the teacher to strengthen his current knowledge. They also might be using ICT for preparing different documents pertaining to academics.

CONCLUSIONS

Awareness of different ICT of the faculty members was found to be a major limiting factor for ICT utilization in Agricultural education. Most of the faculty member's exposure access to ICT tools & program was found to be very low. The finding is an indication that there is every scope to enhance the ICT utilization of agricultural education as three fourths of the faculty members were under low to medium level of ICT utilization.

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Figure 1: Distribution of Faculty Members by their Overall Extent of ICT Utilization

Figure 3: Extent of Utilization on Overall Information and Communication Technology (ICT)

Figure 4: Ranking of Different Components of ICT's Based on Extent of ICT Utilization by Faculty Members

Figure 5: Ranking of Different Academic Activities Based on Utilization of ICT by the Faculty Members