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Utilization pattern of ICTs by the students of agricultural universities

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Abstract

ICT is significant help in the process of Education. This study aims to investigate the use of ICT tool pattern among the students studying in three agricultural universities namely Birsa Agricultural University, Ranchi; Dr. Rajendra Prasad Central Agricultural University, Pusa, Samastipur; and Bihar Agricultural University, Sabour, Bhagalpur. For the purpose of study on the extent and purpose of the usage of ICT, the 90 students (30 from each university) were selected. Statistical tools were used and data were collected by structured questionnaires. The results indicated a high application of ICT tools like web services specifically agricultural apps, despite its low utilization. Aspects such as accessibility, expertise, and previous training have a massive impact on adopting ICT. The study concludes that ICT infrastructure, capacity building, and awareness need to be improved among agricultural educators for effective use of ICT in agricultural education.

Keywords: Agricultural education, web services, agricultural apps, ICT utilization, students adoption

Introduction

ICT (Information and Communications Technology) is an umbrella term that includes any communication device or application, covering: radio, television, cell phones, computer and network hardware and software, satellite systems, etc., as well as the various services and applications related with them, such as videoconferencing and distance learning. It is the digital processing and the use of information through the use of electronic computers. Almost in all situations or tasks, we find the integration and use of technology to solve problems.

The United Nations (2005) [11] points out the potential of ICT to expand access to quality education, promote literacy and provide universal primary education in developing countries. ICT is considered an "important tool to build knowledge societies" (UNESCO, 2003) [10]. ICT provides students and teachers with new tools with which to learn and teach. Teaching with the blackboard, textbooks, radio / television and film have been used for educational purposes over the years, none of them has a significant impact on the educational process such as the computer and the Internet. Traditional ICT tools, for example. T.V., Radio and Telephone have already established their credibility and effectiveness in the promotion of development plans in rural and marginalized areas. Modern ICT tools are computers, internet and wireless communication technology, along with powerful software that can process and integrate sound, text and video into electronic media.

Information communication technology is one of the major yardsticks to measure socioeconomic development of each country. The rapid diffusion of information and communication technologies (ICTs) during the last two decades had effective impact on all the area of human efforts. Internet usage in home and work place has become imperative to address the emerging issues and needs of the hour. UNESCO (2002) [9] assumed ICT: the infusion of technology in education has been seen as a means to enhance and extend not only the instructional methods, but also the learning process in this 21th century. ICT use will improve the efficiency and effectiveness of the management of education, at all levels. Digital tools in agricultural universities help students and scientists learn better, make research more efficient, and help promote precision agriculture. Information and Communication Technologies are adopted and facilitate alternatives to reach the scientific database of continuous need to update on crops and agriculture, e-learning, etc., helping to maximize theoretical knowledge into practical outputs. Data were collected and analysed from students across various agricultural universities to understand how ICTs are being adopted, including overall ICT utilization levels.

Materials and Methods

The study was carried out at three agricultural university

(Birsa agricultural university, Ranchi, Dr. Rajendra Prasad central agricultural university, Pusa, Samastipur and Bihar agricultural university, Sabour, Bhagalpur) with 90 students (30 from each university) selected by purposive sample. Various ICT tools were assessed in this research (Internet/web services, Mobile map technology, Digital storytelling, Radio/Community radio, Video conferencing, Teleconferencing, Digital Library, Expert system, Kiosks, Kisan Call Center, SATCOM, IMCD, GIS, Agricultural Apps) using the 'ex-post facto' research design. Data were collected through structured questionnaires, direct observation and group discussions.

Utilization Pattern

ICT utilization pattern was operationally defined as pattern of use of ICT in research, teaching and extension frequency, places of access, expertise in use of ICT tools, and purpose of use ICT components. To measure ICT utilization pattern of students, indicators *viz*. (a) Extent of utilization, (b) Ranking of utilization & Purpose of utilization were taken, which are categorised as below:

a. Extent of utilization of ICT tools

The extent of utilization of ICT tools was categorized under following types.

Category	Score
Frequently (F)	2
Rarely (R)	1
Never (N)	0

This Procedure was followed by Shaik and Rao

The possible obtainable scores ranged between 28 and 0 respectively. Based on the total scores, the respondents were classified into three categories namely low, medium and high, as here under:

Category	Range
Low	Less than (mean- S.D.)
Medium	Between (mean± S.D.)
High	More than (mean+ S.D.)

This procedure was followed by Belgavimath

b. Purpose of utilization of ICT tools

It has been operationalized as purpose of use of ICT tools i.e., Internet, digital library, agricultural apps etc. each for the various research, teaching and extension activities.

The purpose of utilization was classified under following categories.

Category	Score
For specific topic/research information	1
For getting reviews	2
For gaining knowledge	3
For making project	4

The classification procedure is modification of the procedure followed by Thangaraja *et al*.

Results and Discussion

This part depicts the extent of utilization, ranking of utilization and purpose of utilization of ICT tools by the students of agricultural universities. Extent of utilization has been categorized into low, medium and high category.

1. Extent of utilization of ICT tools by the students of agricultural universities

It is revealed by Table1. that majority of the students of BAU, Ranchi and Dr. RPCAU, Pusa had low extent of utilization as reflected by the percentage value of 40.00% and 43.33%, respectively. But the majority of the students of BAU, Sabour had high extent of utilization. In case of BAU, Ranchi, the low extent of utilization was followed by high (36.66%) and medium (26.66%) extent of utilization. Dr. RPCAU, Pusa followed the trend of BAU, Ranchi and in this case also, the low extent of utilization was followed by high extent of utilization (30.00%) and medium extent of utilization (26.66%).

Overall, the extent of utilization had been found low (37.77%) which was followed by high (36.66%) and medium (25.55%).

The foregoing gives a cue to infer that majority of the students had either high or low extent of utilization and medium extent of utilization is at the lowest. This may be related to accessibility of ICT tools where the students who had ICT gadgets used ICT tools more frequently.

Table 1: Extent of utilization of ICT tools by the students of agricultural universities.

Sl. No.	Extent of utilization	Frequency and percentage of students						Total (N=90)
		BAU, Ranchi (n=30)		Dr. RPCAU, Pusa (n=30)		BAU, Sabour (n=30)		
		F	%	f	%	F	%	
1	Low (<13)	12	(40)	13	(43.33)	9	(30)	34(37.77)
2	Medium (13-14)	7	(23.33)	8	(26.66)	8	(26.66)	23(25.55)
3	High (>14)	11	(36.66)	9	(30)	13	(43.33)	33(36.66)

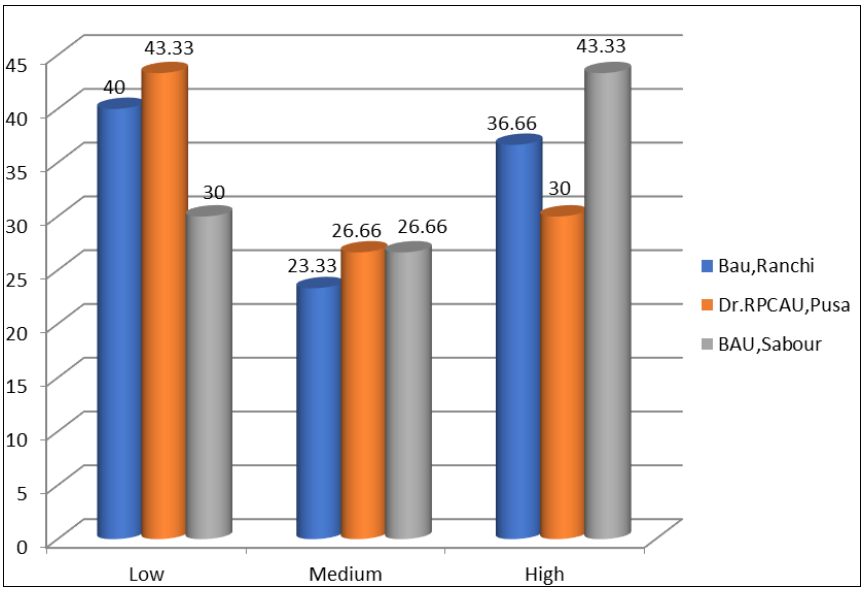

Fig 1: Extent of utilization of ICT tools by the students of agricultural universities

2. Ranking of utilization of ICT tools by the students of agricultural universities

The ranking of utilization of ICT tools by the students of agricultural universities has been detailed in this section. Table 2 explains the mean score values and ranking based on them in respect of students of agricultural universities. The table shows that Web-services have been used frequently by the students of all the three agricultural universities as depicted by the weighted mean score value of 2.00 in all the three selected universities and overall which was followed by the utilization of agricultural apps as depicted by weighted mean score value of 1.46, 1.50 and 1.60 in case of BAU, Ranchi, Dr. RPCAU, Pusa and BAU, Sabour and overall, respectively. Similarly, in case of Kishan call center, the weighted mean score values have been found highest in case of BAU, Sabour (1.40), followed by Dr. RPCAU, Pusa (1.36) and BAU, Ranchi (1.23) and the overall weighted mean score was found 1.33. Based on weighted mean score, the table also shows the ranking of ICT tools was found highest in case of Web services(I) followed by Agricultural apps (II), Kishan call center (III),Geographical Information System(GIS) (IV),Video conferencing (V),Mobile map technology (VI),Community radio station (VII), Digital storytelling (VIII), Teleconferencing (IX) and Kiosks (X).Digital library and Expert system jointly obtained rank XI which were followed by Satellite Media Communication (SATCOM) (XII) and Interactive Media Communication Device (IMCD) (XIII).

It could be concluded that Web services and agricultural apps are used more frequently by the student. The use of Geographical Information System is quite encouraging because this tool has otherwise very important application. The findings led to infer that some of the ICT tools are more versatile and easier to use with incorporation of Graphic User Interface (GUI). The increased use of Web services and agricultural apps will pave the way for the use of other difficult ICT tools

Table 2: Mean score and ranking of Utilization pattern of ICT tools by the students of agricultural universities

Sl. No.	ICT tools	Frequency of utilization				
		BAU, Ranchi Weighted mean Score (n=30)	Dr. RPCAU, Pusa Weighted mean Score (n=30)	BAU, Sabour Weighted mean Score (n=30)	Total weighted mean score N=90	Rank
1	Web services	2.00	2.00	2.00	2.00	I
2	Mobile map technology	0.73	0.86	0.9	0.83	VII
3	Digital storytelling	0.26	0.56	0.86	0.56	VIII
4	Radio/community radio station	0.76	0.8	0.66	0.74	VI
5	Video conferencing	0.26	1.33	1.30	0.96	VI
6	Tele conferencing	0.36	0.53	0.56	0.48	IX
7	Digital library	0.36	0.36	0.6	0.44	XI
8	Expert system	0.33	0.33	0.66	0.44	XI
9	Kiosks	0.33	0.3	0.73	0.45	X
10	Kisan call center	1.23	1.36	1.40	1.33	III
11	SATCOM	0.23	0.23	0.23	0.23	XII
12	IMCD	0.13	0.13	0.13	0.13	XII
13	GIS	0.93	1.06	1.2	1.06	IV
14	Agricultural apps	1.46	1.5	1.6	1.52	II

3. Purpose of utilization of ICT tools by the students of agricultural universities

ICT tools are used for various purposes like getting research information, collecting review enriching knowledge and making project.

It is indicated by the Table 3 that Web services are used for specific topic/research information (66.66%), for getting reviews (55.55%), for gaining knowledge (94.44%) and for making project (72.22%). Similarly, the Digital library is use for specific topic /research information (66.66%), for getting reviews (38.88%) for gaining knowledge (61.11%) and for project making (44.44%) similarly, Expert system is used for specific topic/ research information (35.55%) for getting reviews (53.33%), for gaining knowledge (55.55%) and for project making (22.22%). Agricultural apps have been found to be used for substantially higher proposition of students as indicated by (30.00%), (20.00%), (61.11%) and (11.11%) in case of research information, collecting review, gaining knowledge and making project.

It could be inferred from the table that Web services are most Versatile for most of the purposes.

Table 3: Purpose of utilization of ICT tools by the students of agricultural universities

Sl. No.	ICT tools	Purpose of utilization			
		For specific topic/research information	For getting reviews	For gaining knowledge	For making project
1	WEB SERVICES	60 (66.66)	50 (55.55)	85 (94.44)	65 (72.22)
2	Mobile map technology	23 (25.55)	12 (13.33)	60 (66.66)	10 (11.11)
3	Digital storytelling	8 (8.88)	30 (33.33)	40 (44.44)	35 (38.88)
4	Radio/community radio station	15 (16.66)	35 (38.88)	65 (72.22)	20 (22.22)
5	Video conferencing	12 (13.33)	12 (13.33)	55 (61.11)	11 (12.22)
6	Tele conferencing	15(16.66)	11 (12.22)	25 (27.77)	10 (11.11)
7	Digital library	60 (66.66)	35 (38.88)	55 (61.11)	40 (44.44)
8	Expert system	32 (35.55)	30 (33.33)	50 (55.55)	20 (22.22)
9	Kiosks	55 (61.11)	20 (22.22)	47 (52.22)	9 (10)
10	Kisan call center	15 (16.66)	12 (13.33)	40 (44.44)	7 (7.77)
11	SATCOM	10 (11.11)	5 (5.55)	25 (27.77)	5 (5.55)
12	IMCD	11 (12.22)	7 (7.77)	15 (16.66)	5 (5.55)
13.	GIS	15 (16.66)	15 (16.66)	25 (27.77)	8 (8.88)
14.	Agricultural apps	27 (30)	20 (22.22)	55 (61.11)	10 (11.11)

Note: 1. Figures in the parenthesis indicate percentage

4. Multiple responses are possible

The probable reason might that web services has its wide application in the field of higher education. In case of research, it helps an individual to access unlimited information and expose to wider spectrum of ideas and concepts. Manual search is laborious and time consuming whereas online search made retrieval of information. It helps browsing electronic journals, research reports and books.

5. Association of independent variables with extent of utilization of ICT tools

Table 4. shows the relationship between independent and dependent variable 'extent of utilization'. Out of six independent variables, five variables i.e. age, education, accessibility of ICT tools and experience related to ICT tools, was found to be significantly correlated with extent of utilization of ICT tools at 1% level of significance. The variables *viz*, training undergone in ICT use was significantly correlated at 0.01 level of significance. Only one variable i.e. residential background showed statistically non-significant relationship with extent of utilization of ICT tools.

Table 4: Pearson Correlation coefficient(r) between independent variables and dependent variable

S. N.	Independent variable	Coefficient of correlation (r value)
		Students
X1	Age	0.527**
X2	Education	0.517**
X3	Residential background	0.329NS
X4	Accessibility of ICT tools	0.288**
X5	Experience related to ICT tools	0.305**
X6	Training undergone in ICT use	0.082*

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (1-tailed).

From the foregoing it could be inferred that residential background does not have any correlation with extent of utilization of ICT tools among students. This gives a cue that it is immaterial whether they belong to rural or urban areas.

Conclusion

The present study highlighted the existing situation of usage of ICT by students of agricultural universities. It can be concluded from the findings of the study, that the overall utilization was low among students. It clearly indicates that,

still there is a large scope, to exploit the potential of ICT among the respondents. This implies that the knowledge level of the respondents in terms of ICTs has to be enhanced and efforts have to be taken for keeping the personnel updated in their knowledge and skill on Information and Communication Technology (ICT) which will also hence increase their utilization and dissemination function.

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