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Factors Affecting Familiarity and Usage of Information and Communication Technologies by Agricultural Extension Scientists in North India

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ABSTRACT

Data on the factors affecting the level of familiarity and usage of Information and Communication Technologies (ICTs) were collected using a pre-tested on-line questionnaire from the Agricultural Extension Scientists (AESs) working in State Agricultural Universities and ICAR Research Institutes of North India. A sample of 154 respondents was selected on the basis of probability proportionate sampling technique. The Duncan's Multiple Range Test (DMRT) showed that there was a significant difference between groups received ICT training and untrained group in familiarity with ICT. The results of Pearson's correlation coefficient showed that time spent on use of ICT by AESs exhibited a positive and significant relationship with their ICT familiarity. The results also indicated that ICT training and ICT familiarity were significantly and positively associated with each other. Age of the AESs was negatively but non-significantly associated with their ICT familiarity and usage.

Keywords: Information, Communication, Technology, Familiarity, Usage

INTRODUCTION

Agricultural extension, which depends largely on information exchange between and among farmers and a broad range of other actors, is an area in which ICT can relate directly with the farmers [29]. Extension services are transforming through the use of multimedia technology, as well as through the possibility of developing innovative approaches based on interactive knowledge development processes that involve researchers, extension specialists and farmers [10]. To ensure an effective competitive status in educational organizations and universities there is a need to improve the ability of such organizations to improve consistently their ICT capabilities [18]. Use of ICT for research, education and extension is being encouraged in the National Agricultural Research System of India and there is wide awareness and adoption of ICT by Agricultural Extension Scientists of India. Hence, a study was taken up to look into factors affecting the familiarity and usage of ICTs among agricultural extension scientists.

Methodology:

The National Agricultural Research System (NARS) in India comprises essentially two main streams, viz. the Indian Council of Agricultural Research (ICAR) at the national level and the State Agricultural Universities (SAUs) at the state level. In India, there are 65 State Agricultural Universities and 99 Research Institutes under ICAR (47 Institutions, 4 Deemed Universities, 17 National Research Centers, 6 National Bureaus and 25 Directorates). The study included all agricultural extension scientists working in State Agricultural Universities and Research Institutes under ICAR in North India. Respondents were selected by using Proportionate Random Sampling method, constituting a sample of 154

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AESs. Data were collected by an online questionnaire using Survey Monkey Website.

For selection of ICT tools a list of 33 ICT tools which were generally used by agricultural extension scientists were prepared and mailed to 110 judges who were professionals related with extension and ICTs in India. The judges were requested to give their response on a five point continuum viz., very relevant, relevant, neutral, irrelevant and highly irrelevant with scores of 5, 4, 3, 2, and 1 respectively. Out of 110 judges 52 replied and six judges responses were not considered due to indifferent careless judging. So the responses of 46 judges were retained for final selection of ICTs. Then the total scores were added for each tool. As per the score the 33 tools were ranked from 1 to 33 from highest score to the lowest. 17 tools from first rank to seventeen rank, as they were perceived more relevant (ICT tools with more than 4 mean score were selected for this study).

In order to investigate the level of ICT usage and familiarity of the AESs scores on five point continuum 0-4 (none-very much) for a set of 17 selected ICT tools responses were collected from Agricultural Extension scientists and scored. Further, the respondents were classified into low, medium and high categories based on cumulative square root frequency method.

Training acquired on ICT referred to the number of ICT related training with their duration undergone by scientists in entire service in the Universities or Institutes. It was ascertained through direct questioning and quantified based on the number of training participated as well as duration of training undergone. Total sample of respondents based on duration of training undergone were categorized into low, medium and high training duration groups by using cumulative square root frequency method and quantified by assigning score of one for low duration, 2 for medium duration and 3 for longer duration. A unit score of one was assigned for the each training undergone to quantify the number of training a respondent received. The sum of scores on number of training and the duration of training formed the respondents total training score. Finally, the respondents were classified into low, medium and high categories based on cumulative square root frequency method.

To compare differences of respondents based on their socio-personal characteristics on familiarity and usage of ICTs, data were analyzed by ANOVA, and then Duncan's multiple range test was used to determine the difference between means ($P < 0.05$). Correlation analysis & multiple regression analysis were computed to find out the degree of relationship and contributing socio-personal factors for ICT Familiarity and Usage. The calculations were carried out using the "Statistical Package for the Social Sciences" (SPSS 11.5).

RESULTS AND DISCUSSION

Socio-personal characteristics:

Results of the present study showed that 39.61 percent of the Agricultural extension scientists who were selected as respondents belonged to the middle age group, followed by young and old age categories, 31.17 and 29.22 percent, respectively. Majority of the respondents were male (80.52 %) and having Ph.D. degree (83.12 percent). Around 44.00 percent of the respondents were Assistant Professor/ Scientist, whereas around 33.00 percent were Senior Scientist /Associate Professor and 23.00 percent were Principal Scientist /Professor. Around 38.00 percent of the respondents were in medium category of experience (125 – 251 months), while around 36.00 percent of them were in short experience category (less than 125 months) and only around 25.00 percent of them were in high category of service experience (more than 251 months).

With regard to usage of ICTs, it was found that 53.00 percent of the respondents were in medium category of duration of usage (3 to 5 hours), while around 31.00 percent of them were in low category (less than 3 hours) and 12.00 percent of them were in high category of duration of usage of ICTs in a day (more than 5 hours). Majority of the respondents had not received any ICT training (67.53 %), 22.73 percent of the respondents were in low category of ICT training (less than 3 scores), while 5.2 percent of them were in high ICT training category (more than 4 scores) and only 4.54 percent of them were in medium category of ICT training (3-4 scores) as per the frequency of training received by them. These results gained support from the findings of Tayade *et al.,* [30] who reported only 6.66 percent of KVK scientists in Maharashtra received ICT training.

Familiarity and usage of ICT:

A detailed analysis of familiarity and usage of ICT revealed that Internet service secured the top rank, followed by computer system that was on second rank, whereas mobile phone got third rank. Satellite dish, community radio, video conferencing and tele-center were ranked fourteenth, fifteenth, sixteenth and seventieth, respectively (Table 1). This indicated that familiarity and usage of these ICT tools were very less among the respondents. This result was contradictory to Aniebonam [6]; Adesope *et al., [3]* and in conformity with the findings of Agwu *et al.* [4] and Fleet [11] who have reported similar observations about usage of ICTs. However, this finding was in conformity with the findings of Olatokun [22] who reported that the use of videoconferencing and teleconferencing facilities was not popular among the women academics. It is well established that as a communication tool, videoconferencing can play a pivotal role. In India many authors have successfully experimented with videoconferencing technology in diverse areas [20].

Similarly, experience from around the world suggests that tele-centres can benefit very much from partnerships with various kinds of groups and organizations. International and national organizations are investing in tele-centres because they believe communities benefit from having accurate information [9]. One of the advantages of tele-centres is that they provide a means of delivering public and private services to rural and remote locations without incurring immediate large investments [17]. Sulaiman *et al.,* [28] concluded that, among the varied tools, the tele-centers and the community radio were found to have the greatest potential in reaching audience with locally relevant content in Hyderabad, India. Singh *et al.,* [26] noted that community radio can play a catalytic role in changing the life of the rural people in Karnataka, India. Community radio can bring pleasure and entertainment to its listeners as well as relevant information and community esteem. Studies have revealed that Australian community radio is a strong and vibrant sector of broadcasting, serving their various audiences and broadcasters well and in many ways [12]. In this era of information revolution it is disappointing to note that the Agricultural Extension scientists of North India are still not familiar and not using modern ICTs such as community radio, video conferencing and tele-center. Hence concerted efforts to promote usage of these ICTs for the benefit of Agricultural Extension needs to be undertaken.

Table 1: Ranking Familiarity & Usage of ICTs by AESs (n=154).

	Familiarity		Usage	
ICTs	Mean ±SD	Rank	Mean ±SD	Rank
Internet services	3.67±.07	1	3.65±.08	1
Computer system	3.62±.10	2	3.62±.11	2
Mobile phone	3.44±.04	3	3.28±.05	3
Multimedia projectors	3.09±.10	4	2.95±.12	6
e-journals	3.05±.08	5	3.05±.08	4
Multimedia	3.03±.12	6	3.03±.11	5
Digital video camera & player	2.94±.10	7	2.46±.10	8
Video films	2.91±.11	8	2.38±.10	9
Landline telephone	2.90±.05	9	2.33±.06	10
Television	2.85±.12	10	2.32±.10	11
e-books	2.75±.09	11	2.82±.10	7
You tube	2.10±.08	12	1.69±.09	13
Internet via mobile phone	2.05±.13	13	1.75±.12	12
Satellite dish	1.85±.12	14	1.19±.12	14
Community radio	1.32±.08	15	0.95±.10	15
Video conferencing	0.98±.13	16	0.77±.10	16
Tele-center	0.90±.09	17	0.68±.10	17

Comparing the Means of Familiarity and Usage of ICT and Socio-personal Characteristics:

Comparison of the means of ICT familiarity and usage with socio-personal characteristics showed that there was no significant difference in between different age groups and different designation groups. This result was contradictory to the result of Madadi *et al.* who reported that comparing the means of the amounts of familiarity with ICT showed that there exist a significant difference at one percent level between group Instructors and Assistant Professors with group of Associate Professors and Full Professors. Comparison of the means of the amounts of ICT familiarity and usage showed that there was no significant difference between different work experience groups. The results comparing the means of the amounts of familiarity with ICT showed that there was a significant difference between medium group in time spent on use of ICT with low group ($P<0.05$), which might be because respondents who spent more time on use of ICT, were more familiar with ICTs than respondents in low group. The results showed that in familiarity with ICT there was a significant difference between high group and other groups of ICT training received ($P<0.05$), which might be because respondents who received more ICT training were more familiar with ICTs. In usage of ICT there was no significant difference among different ICT training received groups (Table 2).

Factors Affecting the Level of Familiarity and Usage of ICTs:

It could be observed from Table 3 that age of the AESs was negatively but non-significantly associated with their ICTs familiarity. This negative association may be due to the fact that young people are often first adopters of new technologies, and this appears to be the case with ICTs. This result was in agreement with the findings reported by Madadi *et al.* [18] who reported that age of the University of Tehran's staff members was negatively and non-significantly associated with their ICTs familiarity. There was non-significant positive association between educational qualification and ICTs familiarity of AESs. Higher education might have provided good opportunity to gain knowledge in ICTs which might be the reason for positive impact on ICTs familiarity but it was not significant, may be due to the fact that the scientists were all having more or less same level of education. This result was supported by the findings of Soltani [27] who

reported that there was positive and non-significant association between the educational qualification and ICTs familiarity of faculty members of the Universities Iran's Medical Studies, Tehran, and Shahid Beheshti. This result was partially supported by the findings of Hazraty [13], Zhang [34] and Madadi *et al.* [18] who reported that there was positive and significant association between the educational qualification and ICTs familiarity of the scientists.

Table 2: Duncan's Multiple Range Test (DMRT) to compare differences of respondents based on their socio-personal characteristics with familiarity and usage of ICT.

Variable	Category	ICT Familiarity (Mean±SEM)	ICT Usage (Mean±SEM)
Age	Young	41.25 [a] ±1.87	37.71 [a] ±1.65
	Middle	44.54 [a] ±1.65	37.80 [a] ±1.44
	Old	42.95 [a] ±1.80	36.44 [a] ±1.60
Gender	Male	43.85 [a] ±1.10	37.38 [a] ±1.01
	Female	39.77 [a] ±2.60	37.37 [a] ±1.89
Educational Qualification	M.Sc / M.V.Sc	39.72 [a] ±2.74	36.76 [a] ±2.19
	Ph.D	43.51 [a] ±1.09	37.37 [a] ±0.98
	Post doctoral/Others	68	53
Designation	Scientist /Assistant Professor	41.37 [a] ±1.68	37.37 [a] ±1.41
	Senior Scientist /Associate Professor	45.96 [a] ±1.66	39.41 [a] ±1.48
	Principal scientist /Professor	42.05 [a] ±1.90	34.50 [a] ±1.75
Work experience	Short	42.00 [a] ±1.69	37.59 [a] ±1.49
	Medium	43.74 [a] ±3.58	39.31 [a] ±3.03
	High	43.59 [a] ±1.36	36.78 [a] ±1.18
Time spent on use of ICT			
	Low	38.28 [b] ±2.00	34.53 [a] ±1.85
	Medium	46.24 [a] ±1.26	38.91 [a] ±1.12
	High	42.10 [ab] ±2.30	38.31 [a] ±2.24
ICT training received	No training	42.11 [b] ±1.27	36.93 [a] ±1.06
	Low	43.57 [b] ±1.92	37.82 [a] ±2.06
	Medium	39.28 [b] ±4.28	38.86 [a] ±5.56
	High	56.25 [a] ±2.87	39.87 [a] ±2.27

[a,b] different words with in colons show significant difference at P< 0.05

It was also found that a non-significant positive relationship existed between designations of AESs and their ICTs familiarity. Higher in level of academic rank might have provided good opportunity to gain knowledge in ICTs which might be the reason for positive impact on ICTs familiarity but it was not significant, may be due to the fact that the scientists were all having more or less same level of academic qualification. This result was supported by the findings of Soltani [27] who reported that there was no meaningful relationship between the designation and ICTs familiarity of faculty members of the Universities Iran's Medical Studies, Tehran, and Shahid Beheshti. However, this result was not similar to results of Hazraty [13], Zhang [31] and Madadi *et al.* [18] who reported that ICTs familiarity was positively and significantly related with designation (P<0.05). Positive association of work experience with ICTs familiarity of AESs was also observed. This could be due to the reason that scientists with more work experience were more familiar with ICTs. This result was in contradictory with the findings of Hazraty [13], Soltani and Madadi *et al.* [18] who reported that ICTs familiarity was negatively and significantly related with work experience of university faculty members (P<0.01).

Time spent on use of ICT by AESs exhibited a positive and significant relationship with their ICTs familiarity in the present investigation. This implies that AESs who were more familiar with ICTs have spent more time to use ICTs in a day.

The present study revealed that ICT training and ICTs familiarity were significantly and positively associated with each other. This positive and significant relationship of ICT trainings with ICTs familiarity of AESs could be attributed to the fact, that present training setup adequately matched the changing needs of their clientele. Hence, adequate attention should be provided to impart ICT training to AESs.

Table 3: Correlation coefficients between ICT familiarity and ICT usage with socio-personal variables.

V.No.	Variables	ICT familiarity (r)	ICT Usage (r)
X1	Age	-0.026	-0.095
X2	Educational Qualification	0.119	0.051
X3	Designation	0.047	-0.054
X4	Work experience	0.004	-0.089
X5	Time spent on use of ICT	0.166*	0.153
X6	ICT training received	0.187*	0.073

* P<0.05

It could be observed from Table 3 that age of the AESs was negatively but non-significantly associated with their ICTs usage. This negative association may be due to the fact that young people are often first adopters of new technologies, and this appears to be the case with ICTs. This result was in agreement with the findings reported by Madadi *et al.* [18] who reported that age of the University of Tehran's staff members was negatively and non-significantly associated with their ICTs usage. This result gained partial support from the findings of Tayade *et al.* [30] who reported that the variable age was negatively significant with ICTs usage by the scientists in Krishi Vigyan Kendra and Regional Research Centre in Amravati district, India. Table 3 revealed non-significant positive association between educational qualification and ICT usage of AESs. The higher the level of education, the greater the amount of usage of ICTs, but it was not significant, may be due to the fact that the scientists were all having more or less same level of education. This result was supported by the findings of Tayade *et al.* [30] and Soltani [27] who reported that there was positive and non-significant association between the educational qualification and ICTs usage. This result was partially supported by the findings of Hazraty (1998), Zhang [31] and Madadi *et al.* [18] who reported that there was positive and significant association between the educational qualification and ICTs usage of the scientists.

It was also found that a non-significant negative relationship existed between designations of AESs and their ICTs usage. The greater the academic rank, the less the amount of usage of ICTs, but it was not significant, may be due to the fact that the scientists were all having more or less same level of academic qualification. This result was in contradictory with the findings of Hazraty [13], Zhang [31] and Madadi *et al.* [18] who reported that ICTs usage was positively and significantly related with designation ($P<0.05$). This result was not similar to results of Tayade *et al.* [27] who reported that there was positive and non-significant association between the designations of the scientists in Krishi Vigyan Kendra and Regional Research Centre in Amravati district, and their ICTs usage.

Negative association of work experience with ICTs usage of AESs was also observed in this study. This could be due to the reason that scientists with less work experience were using more ICTs. This result was in conformity with the findings of Karimi *et al.* and Tayade *et al.* [30] who reported that there was non-significant negative relationship between work experience and ICT usage of professionals. This result partially was in conformity with the findings of Hazraty [13], Soltani [27] and Madadi *et al.* [18] who reported that ICTs usage was negatively and significantly related with work experience of university faculty members ($P<0.01$).

Time spent on use of ICTs by AESs exhibited a positive and non-significant relationship with their ICTs usage in the present investigation. The results in Table 3 indicated that ICT training and ICTs usage were non-significantly and positively associated with each other. This positive relationship of ICT trainings with ICTs usage of AESs could be attributed to the fact, that present training setup adequately matched the changing needs of their clientele. Therefore, ample opportunity may be given to the AESs in usage of ICTs during trainings. This result was partially supported by the findings of Tayade *et al.* [30] and Olatoye who reported that the variable ICT training received was positively significant with ICTs usage by professionals.

Contribution of Socio-personal Variables to ICT Familiarity:

Simple correlation merely portrays co-existence between two variables and did not capture the interaction and intensity of relationship of each independent variable with the dependent variable. Therefore, the data were subjected to multiple regression analysis, for the prediction of socio-personal variables that contribute for variation in ICT familiarity.

Table 4: Multiple regression analysis of ICT familiarity on socio-personal variables.

Variables	Regression coefficients/ (b) values	SE (Standard Error)	"t" value
Constant	10.629	1.320	8.051**
Age (X1)	-1.120	.268	-4.171**
Work experience (X2)	.173	.040	4.367**
Time spent to use of ICTs (X3)	.490	.102	4.808**
ICT training received (X4)	.206	.078	2.636**
Method: Backward	R2= 69.60 %	Durbin-Watson= 1.92	F=23.37**
$Y_1 = -.698 - 1.003\ X_1 + .883\ X_2 + .147\ X_3 + .419\ X_4$			

** P<0.01

Results in the Table 4 revealed that in backward analysis of the independent variables with ICT familiarity, four variables namely, age of the respondents, work experience, time spent to use of ICTs and ICT training received were contributed towards ICT familiarity. The model with all these four variables was a good fit with R-square of 69.60 %.

Conclusions:

In the present study, the ICT training undergone by AESs appeared to be unsatisfactory (67.53% had

not received any ICT training). Hence, more ICT trainings need to be imparted to AESs to make them more knowledgeable and skilful about ICTs.

Modern ICTs which are proved to have greatest potential such as video conferencing, tele-centers and community radio are rarely being used by Extension Scientists in this study which needs attention of planners and policy makers in Agricultural Extension.

Enabling policies and plans for familiarity and usage of ICTs for dissemination of agricultural information need to be developed.

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REFERENCES

1. Adebayo, E.L. and Adesope, O.M. 2007. Awareness, Access and Usage of Information and Communication Technologies between Female Researchers and Extensionists. International Journal of Education and Development using Information and Communication Technology, 3(1): 85-93.
2. Adegbore, A.M., 2011. University Faculty Use of Electronic Resources: A Review of the Recent Literature. PNLA Quarterly, 75(4): 65 - 75.
3. Adesope, O.M., C.C. Asiabaka, E.C. Mathews-Njoku and A.C. Agumagu, 2006. Awareness, Access and Usage of Information and Communication Technologies between Female Researchers and Extensionists. Asian Journal of Information Technology, 5(11): 1295 - 1300.
4. Agwu, A.E., U.C. Uche-Mba and O.M. Akinnagbe, 2008. Use of Information Communication Technologies (ICTs) among Researchers, Extension Workers and Farmers in Abia and Enugu States: Implications for a National Agricultural Extension Policy on ICTs. Journal of Agricultural Extension, 12 (1): 37-49.
5. Akuegwu, B.A., E.P. Ntukidem, P.J. Ntukidem and G. Jaja, 2011. Information and Communications Technology (ICT) Facilities' Utilization for Quality Instructional Service Delivery among University Lecturers in Nigeria. Review of higher education in Africa, 3(1).
6. Aniebonam, M., 2008. UNIBEN AfriHUB centre opens, students praise VC. Retrieved from: http://www.ngrguardiannews.com
7. Archibong, I.A. and D.O. Effiom, 2009. ICT in University Education: Usage and Challenges among Academic Staff. African Research Review, 3(2): 404-414.
8. Chauhan, N.M., 2010. Farmers' Perception about ICT Application: A Case study of Gujarat state. Indian Res. J. Ext. Edu., 10 (3): 21-26.
9. Colle, R.D. and R. Roman, 2001. Modules for training telecentre staffs, an Interim Report with Sample Modules, Cornell University. Retrieved from: http://www.itu.int
10. Dhaliwal, R.K., L. Mohapatra and H.S. Dhaliwal, 2011. ICT for agricultural and rural development. Journal of Extension and Education, 19(1): 110-116.
11. Fleet, G.J., 2012. Growth of Broadband and ICT Adoption By SMEs in Atlantic Canada. Journal of Knowledge Management, Economics and Information Technology, 3.
12. Gordon, J., 2006. A comparison of new British community radio stations with established Australian community radio stations. Journal of Community, Citizen's and Third Sector Media and Communication, 2(1): 15-29.
13. Hazrati, M., 1998. Investigating the Condition of Internet Usage by the Faculty Members of the Universities of Iran's Medical Studies, Tehran, and Shahid Beheshti. Master's thesis, College of Medical Management and Information, Tehran.
14. Ibrahim, A.E., 2004. Use and user perception of electronic resources in the United Arab Emirates University (UAEU). Libri Journal, 54: 21-23.
15. Isiaka, B.T., O.A. Lawal-Adebowale and O. Oyekunle, 2009. Agricultural Extension Agents' awareness of ICT potentials and training needs on usage for improved extension service delivery in selected southwest states of Nigeria. Journal of Humanities, Social Sciences and Creative Arts, 4(1):18-30.
16. Karimi, A., M.A. Daryani, G. Hosseininia, H. Forozanfar and H. Forozanfar, 2011. Factors influencing the use of information and communication technologies (ICTs) by Iranian vocational agricultural educators, Journal of Food, Agriculture & Environment, 9(3&4): 1105-1108.
17. Latchem, C. and D. Walker, 2001. Perspectives on Distance Education Telecentres: Case studies and key issues. The Commonwealth of Learning, Vancouver, ISBN 1-895369-88-6.
18. Madadi, Y., H. Iravanib and S.N. Nooghabic, 2011. Factors effective on Familiarity and Usage of Information and Communication Technology (ICT) University College of Agriculture and Natural Resources, University of Tehran, Iran. Procedia Social and Behavioral Sciences, 15(1): 3625-3632.
19. Malnjali, A., 2002. Interpersonal relationship behavior orientation of agricultural scientists and their work effectiveness. M.Sc. dissertation, Akola.
20. Meena, M.S., K.M. Singh, H.R. Meena and M. Kanwat, 2012. Attitude: A Determinant of Agricultural Graduates' Participation in

Videoconferencing Technology. Journal of Agricultural Science, 4(1): 136-142.
21. Olatokun, W.M., 2007. Availability, Accessibility And Use Of ICTs By Nigerian Women Academics. Malaysian Journal of Library & Information Science, 12(2): 13-33.
22. Olatoye, R., 2011. Levels of participation in ICT training programmes, computer anxiety and ICT utilization among selected professionals. International Journal of Education and Development using Information and Communication Technology, 7(2): 15-26.
23. Omotayo, B.O., 2010. Access, use, and attitudes of academics toward electronic journals: A case study of Obafemi Awolowo University, Ile Ife, Library Philosophy and Practice. Retrieved from: http://unllib.unl.edu/LPP/omotayo.htm.
24. Ovwigho, B.O., P.A. Ifie, R.T. Ajobo and E.I. Akor, 2009. The Availability and Use of Information Communication Technologies by Extension Agents in Delta Agricultural Development Project, Delta State Nigeria. J Hum Ecol, 27(3): 185-188.
25. Sharma, C., 2009. Use and impact of e-resources at Guru Gobind Singh Indraprastha University (India): A case study. Electronic Journal of Academic and Special Librarianship, 10(1): 3-8.
26. Singh, B.K., K.K. Rakesh, V.P. Yadav, D. Singh and H.L. Singh, 2010. Social Impact of Community Radio in Karnataka. Indian Res. J. Ext. Edu., 10(2): 10-14.
27. Soltani, S., 2004. Investigating the Factors Effective on Information and Communication Technology Usage in the Research and Educational Activities of the Faculty members of the University of Shahid Beheshti and University of Tehran. Master of Science Thesis, College of Discipline Science and Psychology, University of Shahid Beheshti.
28. Sulaiman, V.R., N.J. Kalaivani and N. Mittal, 2011. ICTs and Empowerment of Indian Rural Women. What can we learn from on-going initiatives? CRISP Working Paper. Centre for Research on Innovation and Science Policy (CRISP), Hyderabad, India.
29. Tanko, L., O.B. Adeniji and H. Nwachukwu, 2013. Evaluation of the access to and utilization of information communication technology (ICT) facilities among extension officers in Shiroro LGA, Niger State, Nigeria. Journal of Agricultural Extension and Rural Development, 5(1): 8-13.
30. Tayade, A., U.R. Chinchmalatpure and S.V. Supe, 2011. Information and Communication Technology used by the Scientists in Krishi Vigyan Kendra and Regional Research Centre. Journal of Global Communication, 4(1): 16-26.
31. Thanuskodi, S., 2010. Use of Internet and Electronic Resources for Medical Science Information: A Case Study. Journal of Communication, 1(1): 37-44.
32. Woreta, S.A., Y. Kebede and D.T. Zegeye, 2013. Knowledge and utilization of information communication technology (ICT) among health science students at the University of Gondar, North Western Ethiopia. BMC Medical Informatics and Decision Making. Retrieved from: http://www.biomedcentral.com/1472-6947/13/31.
33. Yusuf, M.O., 2005. Integrating Information and Communication Technologies in Nigeria Tertiary Education. An Online Journals of Africa Education Research Network, 43 -50.
34. Zhang, Y., 2005. Age, gender, and Internet attitudes among employees in the business world. Computers in Human Behavior, 21(1): 1-10.