

**RESEARCH ARTICLE :**

Factors influencing the utilization of information and communication technology tools by agricultural extension functionaries

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SUMMARY : The present study was carried out in four districts of Karnataka state during 2016-2017 to identify the factors influencing the utilization of information and communication technology tools by agricultural extension functionaries. Eighty Agricultural officers and Assistant Agricultural officers from Mysuru, Hassan, Tumukuru and Mandya districts formed the sample of the study. The results revealed that education, job experience, achievement motivation, innovative proneness, job involvement, e-readiness, organizational climate, mass media utilization, accessibility to ICT tools and training on ICT tools of agricultural extension functionaries were found to be having significant to highly relationship with their extent of utilization of ICT tools. All the 14 personal, socio-economic, psychological and communication characteristics of agricultural extension functionaries put together have contributed to the tune of 74.50 per cent variation in the extent of utilization of ICT tools. The results of the path analysis revealed that training on ICT tools, accessibility to ICT tools and education had direct, indirect and largest indirect effects on the extent of utilization of ICT tools by agricultural extension functionaries.

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BACKGROUND AND OBJECTIVES

The whole world is witnessing a revolution in Information and Communication Technology (ICT) leading to the swift and accurate transfer of message from source to receiver. The term ICT first came into picture during 1997 in a report prepared by Dennis Stevenson for the United Kingdom Government. Information Communication Technology can be seen as an integration of

information technology (IT) with media broadcasting technologies, audio/ video processing and transmission and telephony. In recent times, however, there has been a revolution with regards to ICT in agriculture and particularly in extension service delivery of India. ICTs enable extension workers to gather, store, retrieve and disseminate a broad range of information needed by farmers such as information on best practices, better prices of inputs and outputs, better storage facilities,

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improved transportation links, collective negotiations with buyers, and information on weather, thus transforming extension workers into knowledge workers. The emergence of such knowledge workers will result in the realization of bottom-up, demand driven technology generation, assessment, refinement and transfer. ICT helps the extension system in re-orienting itself towards the overall agricultural development of small production systems.

The availability of ICT tools alone cannot influence the extension functionaries to use them for dissemination of farm technology to the farmers, but there are other amalgam of factors which influence the agricultural extension functionaries for the effective use of ICT tools. In this backdrop, the present study is undertaken to unearth the factors (personal, socio-economic, psychological and communication characteristics of agricultural extension functionaries) influencing the extent of utilization of ICT tools. The present study was undertaken with the following specific objectives:

- To find out the relationship and extent of contribution of personal, socio-economic, psychological and communication characteristics of agricultural extension functionaries on the extent of utilization of ICT tools
- To know the direct, indirect and largest indirect effects of personal, socio-economic, psychological and communication characteristics of agricultural extension functionaries on the extent of utilization of ICT tools

RESOURCES AND METHODS

The present study was carried out in four districts of Karnataka state during the year 2016-2017. A sample of 80 agricultural extension functionaries (Agricultural Officers and Assistant Agricultural Officers) working in 43 Raitha Samparka Kendras in Mysuru, Mandya, Hassan and Tumakuru districts were sampled for the study. Information on 14 personal, socio-economic, psychological and communication characteristics of agricultural extension functionaries were collected using a structure schedule with suitable scales. The collected data was analyzed using frequency, percentage, mean, standard deviation, zero order correlation test, multiple regression test and path analysis.

OBSERVATIONS AND ANALYSIS

The results obtained from the present study as well

as discussions have been summarized under following heads:

Relationship between personal, socio-economic, psychological and communication characteristics of agricultural extension functionaries with their extent of utilization of ICT tools :

Table 1 reveals that accessibility to ICT tools and training on ICT tools of extension functionaries had highly significant relationship with their extent of utilization of ICTs at one per cent level of probability. Whereas, education, job experience, achievement motivation, innovative proneness, job involvement, e-readiness, organizational climate and mass media utilization of extension functionaries were found to be having significant relationship with their extent of utilization ICT tools at five per cent level. The remaining four variables namely, age, rural urban background, scientific orientation and perceived work load of extension functionaries were found to be having non-significant relationship with their extent of utilization of ICT tools. The explanation for the personal, socio-economic, psychological and communication characteristics of extension functionaries having significant to highly significant relationship with their extent of utilization of ICT tools is presented in the following paragraphs.

Education provides an opportunity for the extension

Table 1 : Relationship between personal, socio-economic, psychological and communication characteristics of agricultural extension functionaries with their extent of utilization of ICT tools (n=80)

Sr. No.	Factors /Characteristics	Correlation co-efficient (r value)
1.	Age	0.192 ^{NS}
2.	Education	3.129*
3.	Rural urban background	0.199 ^{NS}
4.	Job experience	2.221*
5.	Achievement motivation	2.761*
6.	Innovative proneness	2.562*
7.	Scientific orientation	0.192 ^{NS}
8.	Perceived work load	0.096 ^{NS}
9.	Job involvement	0.268*
10.	Accessibility to ICT tools	0.431**
11.	e-readiness	2.777*
12.	Organizational climate	0.231*
13.	Training on ICT tools	0.561**
14.	Mass media utilization	0.279*

NS=Non-significant, * and ** indicate significance of values at P=0.05 and 0.01, respectively

functionaries to expose themselves to various ICT tools, which are useful in carrying messages on different aspects of farming in a handy manner. The respondents with more job experience would have used a wide variety of ICT tools over the years, while working in different places and through interaction with a diverse number of farm scientists and extension workers. The extension functionaries with higher achievement motivation would try to perform their job efficiently in conducting various extension activities using a variety of ICT tools. Since ICTs are more innovative methods of transferring farm technology than the traditional extension methods, the extent of utilization among extension functionaries with more innovative proneness will also be high.

Extension functionaries with more job involvement will relate the improvement in their work efficiency to their overall development. Since usage of ICTs in extension activities will improve their working performance, the extension functionaries with more job involvement will also have higher utilization of ICT tools. The respondents having more accessibility to ICT tools at RSKs and at personal level tend to use the ICT tools to a greater extent in their job. The respondents having higher e-readiness to ICT tools will use the same to a greater extent to perform their job effectively and efficiently. The extension functionaries with more level of organizational climate will feel more comfortable using the available ICT tools in an effective manner and thus would have higher utilization of ICT tools.

Training provides an opportunity to the extension functionaries for developing knowledge and skill in effectively utilizing ICT tools. Thus, training on ICT tools would influence the extension functionaries to utilize the ICTs to a greater extent. Frequent use of mass media use would facilitate the respondents to develop a habit of gathering more information on using ICT tools like radio, television, newspaper and other literature. More or less similar findings were reported by Jha *et al.* (2014), Raghava and Punna Rao (2014); Khamoushi and Gupta (2015) and Sulaiman Umar *et al.* (2015).

Extent of contribution of personal, socio-economic, psychological and communication characteristics of agricultural extension functionaries on the extent of extent of utilization of ICT tools :

Table 2 reveals that 74.50 per cent variation in the extent of utilization of ICT tools by extension functionaries was explained by all the 14 independent variables included in the study as evidenced by R² value of 0.7450. The data in Table 2 also reveals that education, job involvement, accessibility to ICT tools and training on ICT tools of extension functionaries were significantly contributing to the extent of utilization of ICT tools at one per cent level of probability. Whereas, innovative proneness, e-readiness and mass media utilization of extension functionaries were significantly contributing to the extent of utilization of ICT tools at five per cent level of probability. The remaining variables such as, age, rural-

Table 2 : Extent of contribution of personal, socio-economic, psychological and communication characteristics of agricultural extension functionaries on the extent of utilization of ICT tools (n=80)

Sr. No.	Factors /Characteristics	Regression co-efficient	SE of regression co-efficient	't' value
1.	Age	0.036	0.040	1.11 ^{NS}
2.	Education	0.305	0.916	2.99**
3.	Rural-urban background	0.485	0.481	0.99 ^{NS}
4.	Job experience	0.367	0.287	0.78 ^{NS}
5.	Achievement motivation	0.230	0.412	1.79 ^{NS}
6.	Innovative proneness	0.410	0.912	2.20*
7.	Scientific orientation	0.208	0.378	1.81 ^{NS}
8.	Perceived work load	0.034	0.061	1.77 ^{NS}
9.	Job involvement	0.301	0.816	2.71**
10.	Accessibility to ICT tools	0.325	0.910	2.80**
11.	e-readiness	0.368	0.925	2.51*
12.	Organizational climate	0.689	0.386	0.56 ^{NS}
13.	Training on ICT tools	0.324	0.911	2.81**
14.	Mass media utilization	0.386	0.816	2.11*

NS=Non-significant, * and ** indicate significance of values at P=0.05 and 0.01, respectively

SE= Standard Error; R²= 0.7450; F = 10.66**

urban background, job experience, achievement motivation, scientific orientation, perceived workload and organizational climate did not significantly contribute to the extent of utilization of ICT tools of extension functionaries. Variables such as education, job involvement, accessibility to ICT tools, training on ICT tools, innovative proneness, e-readiness and mass media utilization of extension functionaries are directly influencing the extent of use of ICT tools.

Direct, indirect and largest indirect effects of personal, socio-economic, psychological and

communication characteristics of agricultural extension functionaries on the extent of utilization of ICT tools :

The path co-efficient of personal, socio-economic, psychological and communication characteristics of agricultural extension functionaries with respect to their direct effects, total indirect effects and largest indirect effects channeled through other independent variables on extent of utilization of ICT tools are presented in Table 3. For the purpose of path analysis, ten variables which were found to be having significant relationship with the extent of utilization of ICT tools by agricultural

Table 3 : Direct, indirect and largest indirect effects of personal, socio-economic, psychological and communication characteristics of agricultural extension functionaries on the extent of utilization of ICT tools (n=80)

Factor No.	Factors / Characteristics	Direct effect	Rank	Total indirect effect	Rank	Three largest indirect effect channeled through
X1	Education	0.201	3	0.081	2	0.186 X9 0.090 X6 0.017 X7
X2	Job experience	0.090	10	0.011	10	0.109 X9 0.102 X6 0.091 X1
X3	Achievement motivation	0.196	5	0.016	5	0.240 X9 0.201 X6 0.199 X1
X4	Innovative proneness	0.200	4	0.059	6	0.126 X9 0.111 X6 0.096 X3
X5	Job involvement	0.108	9	0.026	9	0.151 X6 0.09 X4 0.04 X3
X6	Accessibility to ICT tools	0.221	2	0.078	3	0.168 X9 0.111 X6 0.091 X5
X7	E-readiness	0.111	8	0.066	4	0.222 X9 0.191 X6 0.080 X1
X8	Organizational climate	0.158	7	0.046	7	0.268 X6 0.167 X5 0.096 X8
X9	Training on ICT tools	0.291	1	0.099	1	0.198 X6 0.112 X1 0.097 X3
X10	Mass media utilization	0.161	6	0.039	8	0.112 X9 0.009 X1 0.008 X8

Residual effect : 0.3255

extension functionaries were considered.

It is evident from the Table 3 that all the ten variables selected for path analysis had positive direct effect on extent of participation of farmers.

Ranking variables based on their direct effect on extent of participation revealed that training on ICT tools (X9), accessibility to ICT tools (X6) and education (X1) occupied first three ranks in that order, whereas e-readiness (X7), job involvement (X5) and job experience (X2) obtained the last three ranks in the same order.

With regards to total indirect effects channeled through other variables for each of the independent variables, it was found quite substantial. Ranking of these effects revealed that training on ICT tools (X1), education (X1) and accessibility to ICT tools (X6) occupied the first three ranks which had the highest total indirect effect on the extent of participation in the descending order of magnitude. On the other hand, mass media participation (X10), job involvement (X5) and job experience (X2) occupied the last three in the same order.

The first largest indirect effect channeled through training on ICT tools (X9) in the case of seven variables, while the second largest indirect effect channeled through accessibility to ICT tools (X6) in case of five variables. However, the third largest indirect effect has channeled through education (X1) in case of four variables. It can be inferred from the findings of the results that training on ICT tools (X9), accessibility to ICT tools (X6) and education (X1) had direct, indirect and largest indirect effects on the extent of utilization of ICT tools by agricultural extension functionaries.

Conclusion :

The results of the study revealed that e-readiness, accessibility to ICT tools, training on ICT tools and mass

media utilization were found to be having significant to highly relationship with their extent of utilization ICT tools. Therefore, there is a need by the Karnataka State Department of Agriculture to arrange for periodic training programmes on the utilization and maintenance of ICT tools to the agricultural extension functionaries working in RSKs. Sufficient budget needs to earmarked to the RSKs by the State Government for purchasing and maintenance of ICT tools at RSKs. Mass media should carry messages on using new ICT tools available in the market for developing favourable attitude among extension functionaries regarding the usage of ICT tools effectively.

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