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RESEARCH PAPER

Perceived effectiveness of extension teaching methods used by extension personnel for transfer of technology

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Abstract: The present investigation was conducted in Dharwad and Gadag districts of Karnataka. *Ex-post facto* research design was employed for the study. From each district 45 extension personnel were selected randomly to constitute a total sample size of 90 respondents. The results of the study revealed that farm and home visit (83.33 %), result demonstration (78.89 %), krishi mela (67.78 %) and WhatsApp (74.44 %) were perceived as the effective individual contact method, group contact method, mass contact method and social media in transferring knowledge, respectively. Whereas, farm and home visit (78.89 %), Farmers Field School (74.44 %), krishi mela (71.11 %) and WhatsApp (62.22 %) were perceived as the effective individual contact method, group contact method, mass contact method and social media in imparting skills to the farmers, respectively. The independent variables namely, educational qualification, years of experience, job involvement, self confidence and knowledge of extension teaching methods exhibited positive and significant relationship with perceived effectiveness of extension teaching methods in transferring knowledge. While, years of experience, job satisfaction, achievement motivation and knowledge of extension teaching methods were positively and significantly correlated with the perceived effectiveness of extension teaching methods in acquiring skills by farmers. All the eleven independent variables together contributed 38.70 per cent of the variation in perceived effectiveness of extension teaching methods in transferring knowledge and 28.90 per cent of the variation perceived effectiveness of extension teaching methods in acquiring skills by farmers.

Key words: Extension personnel, Extension teaching methods, Perceived effectiveness

Introduction

Extension teaching methods are the tools and techniques used to create situations in which communication can take place between rural people and extension agents. Use of multiple and diversified extension teaching methods ensure that every farmer is affected by ideas and agricultural technologies communicated (Mashshadani *et al.,* 2017). Extension is an on-going process that provides individuals with relevant information, as a result, it helps farmers develop the essential knowledge, skill, and attitude to utilize the information or technology efficiently with the ultimate goal of increasing their efficiency and reaching a greater standard of living. Agricultural extension employs a range of teaching approaches in order to train the rural population with the notion that the more ways a topic is taught and practised, the more quickly individuals tend to understand the subject matter (Okundae, 2007). Blending of traditional (personal contact, demonstrations *etc.*) and latest methods (expert system, radio and TV talk, video films, magazines, newspapers, mobile applications, social media *etc.*) should be employed to communicate the message timely and repeatedly to ensure that farmers adopt the right technology (Singh and Dubey, 2021). Whats App has proved to be potential to construct knowledge (Nain *et al*., 2019). Department of Agriculture, Karnataka made it mandatory for agricultural officials to have smartphones so that they could share information, messages and circulars through WhatsApp (Anonymous, 2016). It is inevitable that one teaching method cannot individually be used in a particular learning situation. The combination of two or more extension teaching method is much more effective to create attention, arouse interest and convince the people to take action for their satisfaction (Gupta, 2012). Selection of extension teaching method should be based on knowledge, understanding and conditions of the farmers. Extension methods help farmers to understand, accept and adopt the technologies easily. Effectiveness of a method depends upon selecting the right method, at right time (Bagdi, 2014). An effective extension communication system is a necessity for extension service to achieve its broad set goal of farmers acquiring knowledge, skill and attitude and in the overall, better their economic strength and standard of living. With this background, the present study was conducted with the objective to determine the perceived effectiveness of extension teaching methods used by extension personnel of Department of Agriculture, Karnataka.

Material and methods

The present study was conducted during the year 2021-22 in Dharwad and Gadag districts of Karnataka. *Ex-post facto* research design was used for the study. The sample for the present investigation constitute Agriculture Officers (AOs) and Assistant Agriculture Officers (AAOs) working in the Department of Agriculture. From Dharwad district 30 AOs and 15 AAOs were selected randomly. Similarly, from Gadag district 30 AOs and 15 AAOs were selected randomly. Thus, the total sample size constitute 90 respondents. The selected respondents were asked about the perception of effectiveness of extension teaching methods based on two parameters such as transferring knowledge and acquiring skills by farmers. In light of the objectives of the study, perceived effectiveness of

extension teaching methods in transferring knowledge and perceived effectiveness of extension teaching methods in acquiring skills by farmers were the dependent variables and variables like age, gender, educational qualification, years of experience, participation in training, job involvement, job satisfaction, achievement motivation, perceived workload, self confidence and knowledge of extension teaching methods were studied as independent variables. A well structured and pre-tested interview schedule was employed to collect the data through personal interview method. The data collected were tabulated and analysed using appropriate statistical tools like frequency, percentage, correlation and regression.

Results and discussion

Perceived effectiveness of extension teaching methods in transferring knowledge

The results presented in Table 1 shows the perceived effectiveness of extension teaching methods in transferring knowledge.

Individual contact methods

The perusal of results in Table 1 pertaining to perceived effectiveness of individual contact methods in transferring knowledge indicates that majority of extension personnel (83.33 %) opined that farm and home visit was the effective method in transferring knowledge followed by farmers' call/phone call (70.00 %) and SMS (50.00 %).

Group contact methods

A cursory look at the results in Table 1 regarding perceived effectiveness of group

Mass contact methods

A careful examination of results in the Table 1 with respect to perceived effectiveness of mass contact methods in transferring knowledge shows that majority of extension personnel (67.78 %) opined that krishi mela/kisan mela was the effective mass contact method in transferring knowledge followed by television (66.67 %), newspaper (66.67 %), radio (65.56 %), campaign (57.78 %), leaflet (54.44 %), mobile

Table 1. Perceived effectiveness of extension teaching methods in transferring knowledge n=90

Extension teaching methods			Effective		Somewhat effective		Not effective	
			f	%	f	%	f	%
Individual Contact Methods								
	i.	Farm and Home Visit	75	83.33	14	15.56	1	1.11
	ii.	Farmer's call/ Phone call	63	70.00	25	27.78	2	2.22
	iii.	Short Message Service (SMS)	45	50.00	38	42.22	7	7.78
Group Contact Methods								
	i.	Result Demonstration	71	78.89	20	22.22	0	0.00
	ii.	Method Demonstration	65	72.22	25	27.78	0	0.00
	iii.	Group Meeting	68	75.56	22	24.44	0	0.00
	iv.	Training	70	77.78	18	20.00	1	1.11
	v.	Field Day/Farmers' Day	65	72.22	25	27.78	0	0.00
	vi.	Study tours/Exposure visits	66	73.33	22	24.45	2	2.22
	vii.	Lecture Method	44	48.89	33	36.67	13	14.44
	viii.	Seminars	44	48.89	38	42.22	8	8.89
	ix.	Farmers Field School	69	76.67	18	20.00	3	3.33
	x.	Workshop	58	64.44	25	27.78	7	7.78
Mass Contact Methods								
	i.	Farm Publications						
	a)	Leaflet	49	54.44	39	43.33	2	2.22
	b)	Folder	48	53.33	41	45.56	1	1.11
	c)	Pamphlet	47	52.22	42	46.67	1	1.11
	d)	Magazines	38	42.22	47	52.22	5	5.56
	ii.	Newspaper	60	66.67	28	31.11	2	2.22
	iii.	Radio	59	65.56	27	30.00	4	4.44
	iv.	Television	60	66.67	24	26.67	6	6.67
	v.	Campaign	52	57.78	32	35.56	6	6.67
	vi.	Exhibition	58	64.44	32	35.56	0	0.00
	vii.	Krishi mela/Kisan mela	61	67.78	29	32.22	0	0.00
	viii.	Poster	45	50.00	43	47.78	2	2.22
	ix.	Chart	40	44.45	48	53.33	2	2.22
	x.	Models	42	46.67	46	51.11	2	2.22
	xi.	Mobile applications	49	54.44	34	37.78	7	7.78
	xii.	Agriculture portals	35	38.89	46	51.11	9	10.00
Social media								
	i.	WhatsApp	67	74.44	21	23.33	2	2.22
	ii.	YouTube	49	54.44	34	37.78	7	7.78
	iii.	Facebook	46	51.11	31	34.44	13	14.45

f = Frequency, % = Percentage

applications (54.44 %), folder (53.33 %), pamphlet (52.22 %) and poster (50.00 %). Further, it was also observed from Table 1 that slightly more than half of the extension personnel expressed that charts (53.33 %), magazines (52.22 %), agriculture portals (51.11 %) and models (51.11 %) were found to be 'somewhat effective' in transferring knowledge.

Social media

The data furnished in Table 1 in connection with perceived effectiveness of social media in transferring knowledge indicates that nearly three fourth of extension personnel (74.44 %) stated that WhatsApp was effective in transferring knowledge. While, 54.44 per cent and 51.11 per cent expressed that YouTube and Facebook were also effective in transferring knowledge among farmers, respectively.

Distribution of extension personnel according to their perceived effectiveness of extension teaching methods in transferring knowledge

The results presented in Table 2 indicates that more than one third of extension personnel (37.78 %) belonged to medium category of perceived effectiveness of extension teaching methods in transferring knowledge. Whereas, 32.22 per cent and 30.00 per cent of them belonged to high category and low category of perceived effectiveness of extension teaching methods in transferring knowledge, respectively.

Relationship between independent variables of extension personnel with their perceived effectiveness of extension teaching methods in transferring knowledge

The results of correlation analysis presented in Table 3 indicates that out of eleven independent variables studied, two variables namely, self confidence and knowledge of extension teaching methods exhibited positive and significant relationship with perceived effectiveness of extension teaching methods in transferring knowledge at one per cent level while, educational qualification, years of experience and job involvement exhibited positive and significant relationship at five per cent significant level. The remaining variables such as age, gender, participation in training, job satisfaction, achievement motivation and perceived workload did not show significant relationship with perceived effectiveness of extension teaching methods in transferring knowledge.

Contribution of independent variables of extension personnel towards perceived effectiveness of extension teaching methods in transferring knowledge

The contribution of independent variables towards perceived effectiveness of extension teaching methods in transferring knowledge was studied through multiple regression analysis and the results of this aspect are presented in Table 4. A cursory glance of the results reveals that among the eleven independent variables, two variables namely, self confidence and knowledge of extension teaching methods contributed significantly towards the perceived effectiveness of extension teaching methods in transferring knowledge at one per cent level while, educational qualification, participation in training and job involvement contributed significantly at five per cent level. The 'F' value was found to be significant at one per cent significant level. The co-efficient of determination (R^2) was 0.387, which revealed that 38.70 per cent of the variation in the perceived effectiveness of extension teaching methods in transferring knowledge was explained by all the eleven independent variables included in the study.

Table 2. Distribution of extension personnel according to their perceived effectiveness of extension teaching methods in transferring knowledge

n = 90

Category	Frequency	Percentage
Low (<75.61)	27	30.00
Medium (75.61 to 83.88)	34	37.78
High (>83.88)	29	32.22
Total	90	100.00
Mean 79.74	S.D 9.73	

Perceived effectiveness of extension teaching methods in acquiring skills by the farmers

The data furnished in Table 5 shows the perceived effectiveness of extension teaching methods in acquiring skills by the farmers.

Individual contact methods

The perusal of Table 5 regarding perceived effectiveness of individual contact methods in acquiring skills by the farmers indicates that more than three fourth of extension personnel (78.89 %) opined that farm and home visits was the 'effective' individual contact method in acquiring skills by farmers followed by 58.89 per cent expressed that farmers' call/phone call was 'effective' individual contact method in acquiring skills. While, 46.67 per cent of them expressed that SMS was 'somewhat effective' individual contact method in acquiring skills.

Group contact methods

A careful observation of the data presented in Table 5 with respect to perceived effectiveness of group contact methods in acquiring skills by farmers reveals that majority of extension personnel opined that Farmers Field School (74.44 %), training (73.33 %), result demonstration (72.22 %) and field day/farmers' day (68.89 %) were the effective group contact method in

Table 3. Relationship between independent variables of extension personnel with their perceived effectiveness of extension teaching methods in transferring knowledge

n=90

Variable code	Variables	'r'
X_1	Age	0.181
X_2	Gender	0.016
X_3	Educational qualification	0.215*
X_4	Years of experience	0.221*
X_5	Participation in training	0.044
X_6	Job involvement	0.229*
X_7	Job satisfaction	0.070
X_8	Achievement motivation	0.124
X_9	Perceived workload	0.199
X_{10}	Self confidence	0.288**
X_{11}	Knowledge of extension teaching methods	0.269**

** = Significant at 1 per cent level of probability

* = Significant at 5 per cent level of probability

Table 4. Multiple linear regression analysis of independent variables of extension personnel with their perceived effectiveness of extension teaching methods in transferring knowledge n=90

Variable code	Variables	Regression coefficient	Standard error	't'
X_1	Age	0.131	0.098	1.343
X_2	Gender	2.085	2.023	1.031
X_3	Educational qualification	0.444	0.176	2.516*
X_4	Years of experience	0.063	0.114	0.550
X_5	Participation in training	0.052	0.226	1.952*
X_6	Job involvement	0.405	0.192	2.108*
X_7	Job satisfaction	0.111	0.205	0.542
X_8	Achievement motivation	0.421	0.245	1.722
X_9	Perceived workload	0.396	0.437	0.906
X_{10}	Self confidence	1.210	0.438	2.761**
X_{11}	Knowledge of extension teaching methods	0.422	0.125	3.365**

R^2 = 0.387 F = 4.486**

** = Significant at 1 per cent level of probability

* = Significant at 5 per cent level of probability

Table 5. Perceived effectiveness of extension teaching methods in acquiring skills by farmers n=90

Extension Teaching Methods		Effective		Somewhat effective		Not effective	
		f	%	f	%	f	%
Individual Contact Methods							
i.	Farm and Home Visit	71	78.89	15	16.67	4	4.44
ii.	Farmer's call/ Phone call	53	58.89	26	28.89	11	12.22
iii.	Short Message Service (SMS)	34	37.78	42	46.67	14	15.56
Group Contact Methods							
i.	Result Demonstration	65	72.22	23	25.56	2	2.22
ii.	Method Demonstration	61	67.78	28	31.11	1	1.11
iii.	Group Meeting	53	58.89	30	33.33	7	7.78
iv.	Training	66	73.33	23	25.56	1	1.11
v.	Field Day/Farmers' Day	62	68.89	26	28.89	2	2.22
vi.	Study tours/Exposure visits	54	60.00	32	35.56	4	4.44
vii.	Lecture Method	36	40.00	37	41.11	17	18.89
viii.	Seminars	41	45.56	30	33.33	19	21.11
ix.	Farmers Field School	67	74.44	21	23.33	2	2.22
x.	Workshop	53	58.89	28	31.11	9	10.00
Mass Contact Methods							
i.	Farm Publications						
a)	Leaflet	35	38.89	46	51.11	9	10.00
b)	Folder	37	41.11	43	47.78	10	11.11
c)	Pamphlet	38	42.22	42	46.67	10	11.11
d)	Magazines	25	27.78	50	55.56	15	16.67
ii.	Newspaper	34	37.78	49	54.44	7	7.78
iii.	Radio	39	43.33	43	47.78	8	8.89
iv.	Television	57	63.33	29	32.22	4	4.44
v.	Campaign	43	47.78	41	45.56	6	6.67
vi.	Exhibition	59	65.56	27	30.00	4	4.44
vii.	Krishi mela/Kisan mela	64	71.11	22	24.44	4	4.44
viii.	Poster	40	44.44	43	47.78	7	7.78
ix.	Chart	39	43.33	40	44.44	11	12.22
x.	Models	44	48.89	39	43.33	7	7.78
xi.	Mobile applications	45	50.00	38	42.22	7	7.78
xii.	Agriculture portals	33	36.67	46	51.11	11	12.22
Social media							
i.	WhatsApp	56	62.22	27	30.00	7	7.78
ii.	YouTube	52	57.78	28	31.11	10	11.11
iii.	Facebook	39	43.33	31	34.44	20	22.22

f = Frequency, % = Percentage

acquiring skills by farmers. Whereas, 67.78 per cent and 60.00 per cent of extension personnel expressed that method demonstration and study tours/exposure visits were also effective group contact methods in acquiring skills by farmers. While, an equal percentage of extension personnel (58.89 %) stated that group meeting and workshop were effective in acquiring skills. Other group contact methods perceived as effective in acquiring skills by farmers were seminars (45.56 %) and lecture method (40.00 %).

Mass contact methods

A cursory glance at the results in Table 5 pertaining to perceived effectiveness of mass contact methods in acquiring skills by farmers indicates that majority of extension personnel (71.11 %) opined that krishi mela/kisan mela was effective mass contact method in acquiring skills by farmers followed by exhibition (65.56 %), television (63.33 %) and mobile applications (50.00 %). Whereas, 48.89 per cent, 47.78 per cent and 44.44 per cent of extension personnel stated that models, campaign and poster were the other mass contact methods 'effective' in acquiring skills, respectively. An equal percentage of extension personnel (43.33 %) indicated that radio and chart were effective in acquiring skills. Other mass contact methods perceived to be effective in acquiring skills by farmers were pamphlet (42.22 %), folders (41.11 %), leaflets (38.89 %), newspaper (37.78 %), agricultural portals (36.67 %) and magazines (27.78 %). Further, the results also revealed that more than half of the extension personnel opined that magazines (55.56 %), newspaper (54.44 %), leaflet (51.11 %) and agricultural portals (51.11 %) were found to be 'somewhat effective' mass contact methods in acquiring skills.

Social media

The results displayed in Table 5 related to perceived effectiveness of mass media in acquiring skills by farmers shows that more than two third of extension personnel (62.22 %) stated that WhatsApp was effective in acquiring skills by farmers. While, 57.78 per cent opined that YouTube was effective in acquiring skills and 43.33 per cent indicated that Facebook was also effective in acquiring skills by farmers.

Distribution of extension personnel according to their perceived effectiveness of extension teaching methods in acquiring skills by farmers

It is evident from the Table 6 that nearly two fifth of the extension personnel (38.89 %) belonged to medium category of perceived effectiveness of extension teaching methods in acquiring skills by farmers. Whereas, 31.11 per cent and 30.00 per cent of them belonged to high category and low category of perceived effectiveness of extension teaching methods in acquiring skills by farmers, respectively.

Table 6. Distribution of extension personnel according to their perceived effectiveness of extension teaching methods in acquiring skills by farmers n = 90

Category	Frequency	Percentage
Low (<71.12)	27	30.00
Medium (71.12 to 80.41)	35	38.89
High (>80.41)	28	31.11
Total	90	100.00
Mean: 75.77		S.D: 10.92

Relationship between independent variables of extension personnel with their perceived effectiveness of extension teaching methods in acquiring skills by farmers

The perusal of data displayed in Table 7 clearly states that out of eleven independent variables studied, two variables namely, job satisfaction and knowledge of extension teaching methods was positively and significantly correlated at one per cent significant level with the perceived effectiveness of extension teaching methods in acquiring skills by farmers whereas, years of experience and achievement motivation were positively and significantly correlated at five per cent significant level. The remaining variables which did not show significant relationship with the perceived effectiveness of extension teaching methods in acquiring skills by farmers were age, gender, educational qualification, participation in training, job involvement, perceived workload and self confidence.

Contribution of independent variables of extension personnel towards perceived effectiveness of extension teaching methods in acquiring skills by farmers

An examination on results of multiple regression analysis presented in Table 8 indicates that among the eleven independent variables, only one variable namely, knowledge of extension teaching methods contributed significantly towards the perceived effectiveness of extension teaching methods in acquiring skills by farmers at one per cent level whereas, educational qualification and achievement motivation contributed significantly at five per cent level. The 'F' value was found to be significant at one per cent significant level indicating that all the independent variables together exerted significant influence on perceived effectiveness of extension teaching methods in acquiring skills by farmers. The co-efficient of determination (R^2) was 0.289, which revealed that 28.90 per cent of the variation in perceived effectiveness of extension teaching methods in acquiring skills by farmers was explained by all the eleven independent variables included in the study.

Table 7. Relationship between independent variables of extension personnel with their perceived effectiveness of extension teaching methods in acquiring skills by farmers n=90

Variable code	Variables	'r'
X_1	Age	0.167
X_2	Gender	0.039
X_3	Educational qualification	0.043
X_4	Years of experience	0.235*
X_5	Participation in training	0.037
X_6	Job involvement	0.017
X_7	Job satisfaction	0.283**
X_8	Achievement motivation	0.264*
X_9	Perceived workload	0.011
X_{10}	Self confidence	0.080
X_{11}	Knowledge of extension teaching methods	0.362**

** = Significant at 1 per cent level of probability

* = Significant at 5 per cent level of probability

Table 8. Multiple linear regression analysis of independent variables of extension personnelwith their perceived effectiveness of extension teaching methods in acquiring skills by farmers n=90

Variable code	Variables	Regression coefficient	Standard error	't'
X_1	Age	0.063	0.118	0.535
X_2	Gender	3.470	2.448	1.417
X_3	Educational qualification	0.438	0.212	2.063*
X_4	Years of experience	0.192	0.138	1.390
X_5	Participation in training	0.001	0.027	0.020
X_6	Job involvement	0.285	0.233	1.224
X_7	Job satisfaction	0.277	0.248	1.119
X_8	Achievement motivation	0.617	0.296	2.085*
X_9	Perceived workload	0.238	0.430	0.553
X_{10}	Self confidence	0.124	0.531	0.233
X_{11}	Knowledge of extension teaching methods	0.458	0.152	3.014**

R^2 = 0.289 F=2.876** ** = Significant at 1 per cent level of probability

* = Significant at 5 per cent level of probability

Conclusion

Extension personnel perceived farm and home visit as the effective individual contact method for transferring knowledge as well as for acquiring skills by farmers. Among group contact methods, result demonstration and Farmers Field School were perceived as effective in transferring knowledge and for acquiring skills by farmers, respectively. Krishi mela/kisan mela was perceived as the effective mass contact method for both transferring knowledge and imparting skills to the farmers. In social media, WhatsApp was perceived as the method for transferring knowledge and acquiring skills to the farmers. Perceived effectiveness of extension teaching methods in transferring knowledge and imparting skills to the farmers was found to be medium. To enhance the effectiveness, the extension personnel should have a great knowledge and skill in conducting different teaching methods. Providing appropriate training on different teaching methods along with regular information updates serves as pivot in increasing the effectiveness. Further, they should ensure active participation from the farmers by arousing interest among them. Out of eleven independent variables, five variables namely, educational qualification, years of experience, job involvement, self confidence and knowledge of extension teaching methods exhibited positive and significant relationship with perceived effectiveness of extension teaching methods in transferring knowledge. All the eleven independent variables together explained 38.70 per cent of the variation in perceived effectiveness of extension teaching methods in transferring knowledge. Further, the variables namely, years of experience, job satisfaction, achievement motivation and knowledge of extension teaching methods showed positive and significant relationship with the perceived effectiveness of extension teaching methods in acquiring skills by farmers. The coefficient of determination explained 28.90 per cent of the variation in perceived effectiveness of extension teaching methods in acquiring skills by farmers.

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