

## Development of Scale to Measure the Attitude of Farmers towards different Audio-Visual Electronic Media and Its Application

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### ABSTRACT

The present study was contemplated to develop and standardize a scale to measure the attitude of farmers towards audio-visual electronic media. The attitude scale developed was found to be reliable and valid. Among the different treatments, Mobile (Whats App) treatment has got highest significance compared to television and agriportal. When compare to control group it can be clearly noticed from the results that treatment area has got more favourable attitude towards different audio-visual electronic media. The results revealed that as high as 43.33 per cent of the farmers had favourable attitude, whereas 33.33 and 23.33 per cent of the farmers had most favourable and least favourable towards Audio-visual electronic media, respectively.

Keywords: Attitude scale, electronic media, likert's summated rating, item analysis, reliability, validity

AGRICULTURAL Extension in the current scenario of rapidly changing world has been recognized as an essential mechanism for delivering knowledge (information) and advices as an input into modern farming (Jones ,1997). Present day agriculture and Indian farming community is facing a multitude of problems to maximize crop productivity. In spite of successful research on new agricultural practices related to crop cultivation, majority of farmers are not getting upper bound yield due to several reasons. One of the reasons that expert / scientific advice regarding crop cultivation is not reaching farming community in a timely manner. Farmers need expert advice well on time to make them more productive and competitive. For this, extension agency plays a major role in bridging this gap to make available the latest technologies at the door step of the farmers. Agricultural extension which depends to a large extent on information exchange between and among farmers on the one hand and a broad range of other actors on the other, has been identified as one area in which electronic media can play a significant role.

Electronic media are technologies offering new ways for communicating and exchanging information and knowledge. Modern electronic media when applied

to conditions in rural areas can help to disseminate information, improve farmer's knowledge, increase their participation and share knowledge with others. It is said that cyber extension would be the major form of information technology, since farmers still have the difficulty in accessing accurate information to make timely decisions. It is essential that information availability is demand - driven rather than supply - driven. The challenge is not only to improve the accessibility of communication technology to farmers, but also to improve its relevance to local conditions and specific situations. There is a great need to utilize electronic media for the advancement of the agricultural sector by involving all the partners in the process. The three important partners in agriculture development are researchers, farmers, and extension workers. They need to interact in the context of the problems faced by the farmers. The extension workers have to provide solutions to the problems faced by farming community. Information may come to farmers from various sources. It may be from personal, impersonal, institutional, localite, cosmopolite or mass media sources. The appropriateness of these sources varies from enterprise to enterprise, situation to situation and from time to time. Further, the credibility of information sources also varies with respect to the

competency and trustworthiness of the source. Hence, it becomes quite important to channelize the right information at the right time and through the right channel. For this, knowledge of different information sources consulted by farmers under different situations and at different times is required by all those concerned. It is the field of agriculture that knowledge networking through electronic media is going to make a big difference in the life of people in the developing world.

Electronic media could provide farmers, the farm related information such as package of practices, weather forecasting, access to credit, prices and availability of farm inputs, market information, etc., the unrestricted flow of information through the electronic media process opens an avenue for the people to view other from a different perspective. Advancement in scientific research has given rise to the most sophisticated new technology in electronic media fields that are now drastically changing the concept of a large size, diversified world to a global village. All we need to do is exploit the resources of electronic media and intertwine it with yield of crops, thereby enhancing quality and quantity of crops in India. The extension organizations all over the country are engaged in designing new methods of communication and information dissemination to reach the farmer at a rate. The agricultural change agents are using electronic media for providing this extension services. Therefore, it is time to understand the existing feeling of the farmers towards the electronic media. As of now, there are no scales available to measure farmers' attitude towards audio-visual electronic media. Hence, the present study is taken up with the following specific objectives

1. To develop a scale to measure the attitude of farmers towards audio-visual electronic media
2. To analyze the attitude of farmers towards different audio-visual electronic media.

#### METHODOLOGY

In this study, Likert (1932) method of summated rating has been utilized for the construction of attitude scale. The present study was conducted in the Shivamogga district of Karnataka state. Bhadravathi taluk in Shivamogga district was selected for the study.

From Bhadravathi taluk, four villages were selected namely Arahatholalu, Attigunda, Dasarakallahalli, Bilaki for the study.

In the present study, the communication tools like television, Agri-portal and Mobile message (Whatsapp) were used for the treatment. The "Before and after" and Randomized group control research designs were used to study the attitude behaviour of farmers who belong to similar age group, land holding and education level.

#### Operationalization of Attitude

Attitude in this study was operationalized as the degree of positive or negative feeling of farmers towards electronic media based extension services. The following points were considered for measuring the attitude of farmers towards electronic media based extension services.

The steps followed in the construction of scale to measure the attitude of farmers towards electronic media have been discussed below:

#### Collection of items

The objective of collection of items for the attitude scale construction is to select the items in such a way that acceptance and rejection of each one will imply favourable or unfavourable attitude towards the electronic media. The items have been carefully edited and selected in accordance with set criteria as the items in any psychological test. The first step in the construction of attitude scale was to collect exhaustive statements/items pertaining to the electronic media accordingly each one expressing some opinion about the psychological object under the study. A large number of items were collected from literature, informal discussions with agriculture extension and the other experts from selected areas. Tentative list of 70 statements pertaining to the attitude of farmers towards the electronic media was prepared.

#### Editing the statements

These statements were edited as per the 14 criteria enunciated by Edwards (1969), Thurstone and Chave (1929). As a consequence, 15 statements were eliminated. The remaining 55 statements were included in the schedule. These statements were found to be non-ambiguous and non-factual.

### Response to raw statements

It is possible all the statements collected may not be relevant equally in measuring the attitude of farmers towards electronic media related to extension services. Hence, the schedule containing these statements on a five point continuum were mailed by post and also handed over personally to the judges. Judges comprised experts in the field of extension education of University of Agricultural Sciences, Bangalore, University of Agricultural Sciences, Dharwad, Extension Education Institute, Hyderabad, National Institute of Agriculture Extension Management (MANAGE), Hyderabad and Extension Education Institute, Anand. The judges were requested to examine each statement and place them on a five point continuum indicating the degree of strength of these statements from strongly agree to strongly disagree. The judges were also requested to make necessary modifications and additions or deletion of statements, if they desire so.

The respondents were asked to indicate their degree of agreement or disagreements with each statement on a five point continuum ranging from strongly agree, agree, neutral, disagree and strongly disagree. The scoring for positive statements was done with 5, 4, 3, 2, and 1 and the scoring pattern was reversed i.e. 1, 2, 3, 4 and 5 for negative statements; respectively.

Out of 100 judges, 50 respondents responded in a time span of one month. The relevancy score of each item was ascertained by adding the scores on rating scale for all the 50 judges' responses. From this data Relevancy Percentage (RP), Relevancy Weightage (RW) and Mean Relevancy Scores (MRS) were worked out for all the 55 statements by using the following formulae.

$$R.W = \frac{MR \times 5 + R \times 4 + N \times 3 + SWR \times 2 + NR \times 1}{\text{No. of judges responded} \times \text{Maximum score}}$$

$$R.P = \frac{MR \times 5 + R \times 4 + N \times 3 + SWR \times 2 + NR \times 1}{\text{No. of judges responded} \times \text{Maximum score}} \times 100$$

$$MRS = \frac{MR \times 5 + R \times 4 + N \times 3 + SWR \times 2 + NR \times 1}{\text{No. of judges responded}}$$

Using these three criteria the statements were screened for their relevancy. Accordingly, statements having relevancy per centage >80, relevancy weightage >0.80 and mean relevancy score >4.0 were considered for further processing. Totally 20 statements were retained in the scale based on t test to measure the attitude towards electronic media. It indicates that the judges do not differ among themselves in their relevancy ratings.

### Item analysis

To delineate the items based on the extent to which they can differentiate the attitude items about electronic media as favourable or unfavourable. Item analysis was carried out on the items selected in the first stage. For item analysis, the responses were arranged in ascending order based on scores. Twenty five per cent of the subjects with the highest total score and 25 per cent with the lowest total scores were selected. These two groups provided the criterion groups in terms of which item analysis was conducted and critical ratio was calculated by using the following formula:

$$t = \frac{\bar{X}_H - \bar{X}_L}{\sqrt{\frac{\sum \bar{X}_H^2 - \left(\frac{\sum \bar{X}_H}{n}\right)^2}{n} + \frac{\sum \bar{X}_L^2 - \left(\frac{\sum \bar{X}_L}{n}\right)^2}{n}}}$$

Where,

$X_H$  = The mean score on given statement of the high group

$X_L$  = The mean score on given statement of the low group

$\sum x_H^2$  = Sum of squares of the individual score on a given statement for high group

$\sum x_L^2$  = Sum of squares of the individual score on a given statement for low group

$n$  = Number of respondents in each group

$\Sigma$  = Summation

$t$  = The extent to which a given statement differentiate between the high and low group.

Based on the item analysis ('t' value), 18 statements with 't' value equal to or greater than 1.75 were finally selected and included in the attitude scale.

**Standardization of the scale by testing reliability and validity**

Reliability: The split-half method was employed to test the reliability of the attitude scale. The value of correlation co-efficient ('r') was 0.9103 which was highly significant at one per cent level indicating the high reliability of the scale. It was concluded that the attitude scale constructed was reliable. The split half test reliability formula used in the present study is as follows:

$$r_{1/2} = \frac{\Sigma(XY - (\Sigma X)(\Sigma Y))}{\sqrt{(\Sigma X^2 - (\Sigma X)^2)(\Sigma Y^2 - (\Sigma Y)^2)}}$$

Where,

“X = sum of the scores of the odd number items

“Y = sum of the scores of the even numbers items

“X<sup>2</sup> = sum of the squares of the odd number items

“Y<sup>2</sup> = sum of the squares of the even number items

**Validity :** It refers to how well a scale measures what it is purported to measure. The validity of the scale was tested by content and statistical validity methods, which was ensured during judges rating and statistical formula.

**Content validity:** According to Kerlinger (1966), it is the representatives or sampling adequacy of the content – the substance, the matter and the topics of a measuring instrument. The item included in the scale was based on extensive review of literature and experts judgments. Therefore, it was assumed that the scale developed was valid with reference to inclusion of relevant contents of concepts under study.

**Statistical validity:** While construction of the scale, statistical validity was worked out by relating attitude score of 50 respondents. The validity co-efficient for the scale was 0.95409, which was also

statistically significant at one per cent level of probability indicating the higher validity of the developed scale. Thus, the developed scale was confined of its validity to use in the sample area. The validity formula is as follows :

$$V = \sqrt{r}$$

The number of attitude statements retained during various steps of scale construction is presented in Table I.

TABLE I  
*Number of attitude statements retained during various steps of scale construction*

Steps	No. of Attitude statements	
	Statements considered	Statements retained
Collection of items	70	70
Editing of items	70	55
Relevancy Analysis	55	38
't' analysis	38	20
Item Analysis	20	18
Reliability and Validity	18	18

**Administering the scale**

The final scale consists of 18 statements (Table-II) for determining the attitude of farmers towards electronic media. Of which, ten are positive statements and the remaining eight statements are negative. The response was collected on a five point continuum, namely, strongly agree, agree, undecided, disagree and strongly disagree with assigned score of 5, 4, 3, 2, and 1, respectively for positive statements and vice versa for negative statements. Thus the minimum and maximum score one could get is 18 and 90, respectively. Higher the attitude score indicates the high favourableness of respondents towards electronic media and lesser the attitude score indicates less favourableness towards electronic media. The total attitude score for each respondent was obtained by adding the weights of individual responses made to the total scale items.

TABLE II

*Statements considered to measure the attitude of farmers towards audio-visual electronic media*

Statements	SA	A	UD	DA	SDA
I would like to use electronic media.					
Electronic media plays an important role for exploring agricultural information.					
Electronic media usage is socially and economically acceptable.					
Electronic media will lead to modernization.					
Use of electronic media will build social capital among farmers.					
Electronic media is an essential part of present day life					
Electronic media can bridge the wide ratio of farmers and extensionist (1000:1)					
Electronic media helps to improve the knowledge, attitude and skill of farmers.					
Electronic media can attract people towards agriculture.					
Electronic media will fasten the adoption of new technologies.					
Electronic media are suitable only to literate people.					
Electronic media is expensive.					
Use of electronic media is more accessible to rich people only.					
Accuracy of the available information on electronic media is questionable.					
Electronic media cannot provide information suitable to a particular culture.					
Watching/ listening to electronic media is a waste of productive time.					
Electronic media are not offering anything new to their users.					
Electronic media are not efficient without electricity.					

Strongly Agree (SA); Agree (A); Undecided (UD); Disagree (DA); Strongly Disagree (SDA)

## RESULTS AND DISCUSSION

**Overall gain in attitude level of farmers in the television treated village**

A close perusal of Table III revealed that mean knowledge score of the respondents in the television treated village increases from 52.41 (before) to 55.38 (after). Value of 't' (3.042) obtained by undertaking the paired t-test shows that there is a significant difference between the two mean attitude scores in the television treated village infer that television brings about a positive change in the attitude level of the farmers. Television has become our part and parcel of farmer life, which transmit information very fast about agricultural technology among the farmers community are the reason for increased favourable attitude of farmers towards television.

TABLE III

*Overall attitude level of farmers towards Television*

(n=30)

Scores	Before	After	t-value
Mean	52.41	55.38	3.042 **
SD	8.24	9.06	

Min. score =18; Max. score =90; \*\* Significant at 1% level

**Comparison of attitude level of farmers before and after the television treatment in the experimental and control villages**

Table IV shows that the 't' value (2.047) is significant, thus proving that the enhancement in attitude level of the farmers in the television treated

TABLE IV

*Comparison of attitude of farmers before and after the television treatment in the experimental and control villages*

Villages	Difference of Means	SD	t-value
Experimental (n=30)	2.97	0.82	2.047 *
Control (n=30)	2.00	1.97	

\* Significant at 5% level; 't' (0.05, 29df) = 2.045

village after the treatment is due to the television programme. Thus, it helps us to infer that television brings about a positive change in the attitude level of the farmers.

#### Overall gain in attitude level of farmers in the mobile treated village

A close perusal of Table V revealed that the mean knowledge score of the respondents in the mobile treated villages increases from 56.87 (before) to 63.41 (after). Value of 't' (5.96) obtained by undertaking

TABLE V

*Overall attitude level of farmers towards mobile*

Scores	Before	After	t-value
Mean	56.87	63.41	5.96 **
SD	13.83	14.98	

Min. score =18, Max. score =90, \*\* Significant at 1% level, 't' (0.01, 29df)=2.462

the paired t-test shows that there is a significant difference between the two mean attitude scores in the mobile treated village. Mobile (WhatsApp) is now-a-days become more popular; here the farmer can upload his problems through photographs, video and find solution to their problems immediately from the experts at the quickest possible time which is the reason behind the increased favourable attitude of farmers towards mobile (WhatsApp).

#### Comparison of attitude level of farmers before and after the mobile treatment in the experimental and control villages

Table VI shows the 't' value (2.97) is significant, thus proving that the enhancement in attitude level of the farmers in the mobile treated villages after the treatment is due to the Mobile (WhatsApp) message. Thus, it helps us to infer that mobile brings about a positive change in the attitude level of the farmers.

TABLE VI

*Comparison of attitude of farmers before and after the Mobile treatment in the experimental and control villages*

Villages	Difference of Means	SD	t-value
Experimental (n=30)	6.54	1.15	2.97 **
Control (n=30)	2.00	1.97	

\*\* Significant at 1% level; 't' (0.05, 29df) = 2.045

#### Overall gain in attitude level of farmers in the agriportal treated village

A close perusal of Table VII revealed that the mean knowledge score of the respondents in the agriportal treated villages' increases from 53.70 (before) to 57.96 (after). Value of 't' (3.57) obtained by undertaking the paired t-test shows that there is a significant difference between the two mean attitude scores in the agriportal treated village. Agriportal is slowly penetrating in rural India, but it has huge option

TABLE VII

*Overall attitude level of farmers towards agriportal*

Scores	Before	After	t-value
Mean	53.7	57.96	3.57 **
SD	10.09	13.04	

Min. score =18; Max. score =90; \*\* Significant at 1% level 't' (0.01, 29df)=2.462

of crop specific solutions by which farmer can get information related to his area of interest is the possible reason for increased favourableness of farmers towards agriportal.

### Comparison of attitude level of farmers before and after the agriportal treatment in the experimental and control villages

Table VIII shows the 't' value (2.509) is significant, thus proving that the enhancement in attitude level of the farmers in the agriportal treated villages after the treatment is due to the Agriportal message. Thus, it helps us to infer that agriportal brings about a positive change in the attitude level of the farmers.

TABLE VIII

*Comparison of attitude of farmers before and after the agriportal treatment in the experimental and control villages*

(n=60)

Villages	Difference of Means	SD	t-value
Experimental (n=30)	4.26	2.95	2.509 **
Control (n=30)	2.00	1.97	

\*\* Significant at 1% level; 't' (0.01, 29df)=2.462

### Overall Relative effectiveness of attitude level of farmers before and after the treatment.

The results in the Table IX revealed that the overall relative effectiveness of different treatments

in attitude level. The paired 't' test was calculated to find out the mean difference before and after the treatments. ANOVA was calculated to find out the F-value to know the significance among the different treatments. It was observed that the mean score before the television treatment was 52.41 and it was increased to 55.38 after the television treatment. The paired 't' value is 3.042 which is significance at 1 per cent level. In case of mobile treatment the mean score before the treatment was 56.87 and it was increased to 63.41 after the mobile treatment. The paired 't' value is 5.96 which is significant at 1 per cent level. Further with respect to agriportal treatment the mean score before treatment was 53.70 and it was enhanced to 57.96 after the agriportal treatment. The paired 't' value is 3.57 which is significant at 1 per cent level. The possible reason for the above result may be due to the fact that when compare to television programme and agriportal information, mobile (WhatsApp) message has got highest significance as it creates a huge platform for farmers to interact directly with the experts, and can easily obtain solution. Even it has got the advantage of uploading PDF files, photos, videos, text message, and voice message.

The reliability and validity of the scale indicated the precision and consistency of the results. Hence, it can be used to measure the attitude of farmers towards

TABLE IX

*Overall Relative effectiveness of attitude level of farmers before and after the treatment*

(n=90)

Treatments	Sample	Before		After		Difference		Paired 't' value
		Mean	SD	Mean	SD	Mean	SD	
T1Television	30	52.41	8.24	55.38	9.06	2.97	0.82	3.042 **
T2Mobile	30	56.87	13.83	63.41	14.98	6.54	1.15	5.96 **
T3Agriportal	30	53.70	10.09	57.96	13.04	4.26	2.95	3.57 **
F-value		0.65 <sup>NS</sup>		0.24 <sup>NS</sup>		3.16 **		

\*\* Significant at 1% level; 't' (0.01, 29df)=2.462; NS=Non-significant

audio-visual electronic media. The scale developed is useful to measure the farmers' attitude beyond the study area with suitable modifications. Further, the study revealed that the mobile (WhatsApp) has more significant role in increasing the favourable attitude of farmers, because it has got a wide advantage of uploading PDF files, photos, videos, text message and voice message.

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