**RESEARCH NOTE**

# A Scale to Measure Farmers' Attitude towards ICT-based Extension Services

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## ABSTRACT

*Presently various forces are working to change the agricultural extension from a process of technology transfer to a process of facilitating wide range of communication, information and advocacy services. The midsts of these change extensionists are grappling with the question of how best to harness ICTs to benefit the farming community. There was no scale available to measure farmers' attitude towards ICTs based extension services. The present study was contemplated to develop and standardize the same. Out of 55 statements, 22 statements were retained on the final scale. The reliability and validity of the scale indicates its precision and consistency of the results. This scale can be used to measure farmers' attitude beyond the study area with suitable modifications.*
*Key words: Attitude scale; ICTs based extension;  Likert's summated rating; Item analysis; Reliability; Validity;*

**A**gricultural 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, the 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  ICTs can play a significant role

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agricultural extension from a process of technology transfer (Research institution to Farmer ) to a process of facilitating a wide range of communication, information and advocacy service (demand driven, pluralistic and decentralized extension ). In the midst of this change, extensionists are grappling with the question of how best to harness ICTs to improve farming community. There was no scale available to measure farmers' attitude towards ICTs based extension services. Hence, the present study was contemplated to develop and standardize a scale for measuring farmers' attitude towards ICTs based extension services. This was a part of the larger Ph.D. study on "Information and Communication Technologies enabled Agricultural Extension System in Andhra Pradesh – A critical analysis" conducted during 2008.

## METHODOLOGY

Attitude is an organized predisposition to think, feel, perceive and behave towards a cognitive object. Attitude is the degree of positive or negative effect associated with some psychological object. According to Thurstone, "psychological object" means any symbol, phrase,

slogan, idea, person and institution towards which people can differ with respect to positive or negative affect.

Attitude in this study was operationalised as the degree of positive or negative feeling of farmers towards the Information and Communication Technologies (ICTs) based Extension services. The method of summated rating suggested by *Likert (1932)* was followed in the development of scale. The following points were considered for measuring the attitude of farmers towards ICTs based extension services.

*1. Collection and editing of statements:* Fifty five statements, expressing the attitude of farmers towards the Information and Communication Technologies (ICTs) based Extension services have been collected from available literature, in consultation with the specialists in the field of extension and they were edited on the basis of criteria suggested by *Thurstone (1946), Likert (1932) and Edward (1957).*

Out of 55 statements, 50 statements were retained after editing. These statements were found to be non-ambiguous and non-factual.

*2. Relevancy test:*It was possible all the statements collected may not be relevant equally in measuring the attitude of farmers towards ICTs based extension services. Hence these statements were subjected to scrutiny by an expert panel of judges to determine the relevancy and screening for inclusion in the final scale. For this all the fifty statements list was then send to panel of judges. Judges comprised experts in the field of extension education of Acharya N G Ranga Agricultural University, Extension Education Institute, Hyderabad, National Institute of Agriculture Extension Management (MANAGE), Hyderabad and Extension Education Institute, Anand. The statements were sent to 60 Judges with request to critically evaluate each statement for its relevancy to measure attitude of farmers towards ICTs based extension services. The judges were requested to give their response on a five point continuum viz, highly relevant, relevant, neutral, irrelevant and highly irrelevant with scores 5,4,3,2 and 1 respectively.

Out of 60 judges only 40 responded in a time span of one month. The relevancy score of each item was ascertained by adding the sores on rating scale for all the 40 judges' responses. From this data relevancy percentage, relevancy weightage and mean relevancy scores were worked out for all the statements by using the following formulae.

*a. Relevancy percentage:* Relevancy percentage was worked out by summing up the scores of highly relevant, relevant and neutral categories, which were converted into percentage.

*b. Relevancy weightage (R.W.):* Relevancy weightage was obtained by the formula.

$$RW = \frac{HRR + RR + NR + IR + HR}{MPS}$$

*c. Mean relevancy score (M.R.S.):* M.R.S. was obtained by the following formula.

$$MRS = \frac{HRR + RR + NR + IR + HR}{N}$$

HRR = Highly relevant response (X5)

RR = Relevant response (X4)

NR = Neutral response (X3)

IR = Irrelevant response(X2)

HR = Highly irrelevant (X1)

MPS = Maximum possible score (40×5 =200).

N = Number of judges (40).

Using these three criteria the statements were screened for their relevancy. Accordingly, statements having relevancy % >70, relevancy weightage >0.70 and mean relevancy score > 3.5 were considered for final selection of statements. By this process, 45 statements were isolated in the first stage, which were suitably modified and rewritten as per the comments of judges.

*3. Calculation of 't' value (Item analysis):* These 45 statements were subjected to item analysis to delineate the items based on the extent to which they can differentiate the respondent with high attitude than the respondent with low attitude towards ICTs based extension services. For this 60 farmers were selected from non sample area. The respondents were asked to indicate their degree of agreement or disagreement with each statement on the five-point continuum ranging from "strongly agree" to "strongly disagree". The scoring pattern adopted was 5 to 1, in which, 5 weighs to strongly agree response, 4 to agree response, 3 to undecided response, 2 to disagree response and 1 to strongly disagree response for positive statement and for negative statement, the scoring pattern was reversed.

Based upon the total scores, the respondents were arranged in descending order. The top 25 per cent of the respondents with their total scores were considered as the high group and the bottom 25 per cent as the low group, so as these two groups provide criterion groups in terms of evaluating the individual statements as suggested by *Edwards (1957)*. Thus out of 60 farmers to whom the items were administered for the item analysis, 15 farmers with lowest, 15 with highest scores were used as criterion groups to evaluate individual items.

The critical ratio, that is the 't' value which is a measure of the extent to which a given statement differentiates between the high and low groups of the respondents for each statements was calculated by using the formula suggested by *Edward (1957).*

$$ t = \frac{X_H - X_L}{\sqrt{\dfrac{\sum (X_H - X_H)^2 + (X_L - X_L)^2}{n(n-1)}}} $$

**Where :**

$$ \sum (X_H - X_H)^2 = \sum X_H{}^2 - \left(\sum X_H\right)^2 $$

$$ \sum (X_L - X_L)^2 = \sum X_L{}^2 - \left(\sum X_L\right)^2 $$

$X_H$ = 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

$\sum X_H$ = Summation of scores on given statement for high group

$\sum X_L$ = Summation of scores on given statement for low group

n = Number of respondents in each group

$\sum$ = Summation

*4. Selection of attitude statements for final scale:* After computing the 't' value for all the items, 22 statements (Table 1) with highest 't' value equal to or greater than 1.75 were finally selected and included in the attitude scale.

5. *Standardization of the scale:* The validity and reliability was ascertained for standardization of the scale. Reliability was measured by test-retest method. *Reliability :*

*Test-retest method* : The final set of the 22 statements, which represent the attitude of farmers towards ICTs based extension services, was administered on five-point continuum to a fresh group of 60 farmers, which were not included in the actual sample. After a period of 15 days the scale was again administered to the same respondents and thus two sets of scores were obtained. The correlation coefficient for the both the sets were worked out. The 'r' value (0.796) was significant at 0.01 level of probability indicating the attitude scale was highly suitable for administration to the farmers as the scale was stable and dependable in its measurement. *Validity of the scale:*

*Content validation :* The content validity of the scale was tested. The content validity is the representative or sampling adequacy of the content, the substance, the matter and the topics of a measuring instrument. This method was used in the present scale to determine the content validity of the scale. As the content of the attitude was thoroughly covered the entire universe of ICTs based extension services through literature and expert opinion, it was assumed that present scale satisfied the content validity. As the scale value difference for almost all the statements included had a very high discriminating value, it seemed reasonable to accept the scale as a valid measure of the attitude. Thus ensuring a fair degree of content validity.

**RESULTS AND DISCUSSION**

The final scale consists of 22 statements. The responses had to be recorded on a five point continuum representing strongly agree, agree, undecided, disagree, and strongly disagree with scores of 5,4,3,2, and 1 for positive statements and vice-versa for negative statements. The attitude score of each respondent can be calculated by summing the scores obtained by him on all the items.

The attitude score on this scale ranges from 22 to 110. The higher score indicates that respondent had more favourable attitude towards ICTs based extension services and vice-versa.

Table 1. The final attitudes scale comprising 22 statements.

| S.No. | Statements | SA | A | UD | DA | SDA |
|---|---|---|---|---|---|---|
| 1 | ICTs provide possible solutions to the present agricultural situation. | | | | | |
| 2* | ICTs can not meet location specific needs of the faarmes. | | | | | |
| 3 | ICTs are potential tools to reach the needy farmers. | | | | | |
| 4 | Farmers feed back is fast through ICTs than traditional methods | | | | | |
| 5* | Illiteracy will not deter farmers in availing ICT services. | | | | | |
| 6* | ICTs can not deliver personalized information. | | | | | |
| 7. | ICT based extension services assist the farmer in planning and decision making aspects in agriculture. | | | | | |
| 8* | 'ICT services' is a distant dream for resource poor farmers. | | | | | |
| 9. | Farmers can get remunerative prices to their produce through ICT based market intelligence. | | | | | |
| 10. | Expert advice makes the farmers enterprise/activities productive. | | | | | |
| 11* | All kinds of information exchange are possible only through ICTs. | | | | | |
| 12. | Existing infrastructure of ICTs is not enough to meet the needs of the farming community. | | | | | |
| 13* | Only  resourceful farmers can get the benefit of the ICTs | | | | | |
| 14 | Access to information centre at village level is boon to the farming community. | | | | | |
| 15 | Phone-in-live with scientists gives first hand information about queries. | | | | | |
| 16* | ICTs alone would solve the problems of farmers. | | | | | |
| 17 | ICT based Pest/disease outbreak warning system facilitate farmers to take preventive measures. | | | | | |
| 18* | ICT extension services avoid the personal extension contact. | | | | | |
| 19 | ICTs based extension services provide new opportunity to build a skilled and knowledge community. | | | | | |
| 20* | ICT is a valuable tool, but it will never influence farmers' own decision making. | | | | | |
| 21 | Weather forecasting through ICTs assists farmers in timely decisions. | | | | | |
| 22* | ICT based extension services are alternative to the present extension system. | | | | | |

**\*** Negative statements.

SA: Strongly agree   A: Agree   UD: Undecided   DA: Disagree   SDA: strongly disagree

## CONCLUSION

The reliability and validity of the scale indicated the precision and consistency of the results. This scale can be used to measure the farmers' attitude beyond the study area with suitable modifications.

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