Construction and validation of a scale for the measurement of attitude of the farmers towards mobile phone-based agro-advisories (MBAs) on cotton crop

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ABSTRACT

Among the various ICT tools, majority of the Indian farmers own mobile phones. The availability and accessibility of mobile phones among the farmers is higher than any other ICT tool. Mobile phones have the advantages of having many additional services in addition to the standard voice function such as SMS for text messaging, email, packet switching for access to the internet, gaming, bluetooth, infrared camera with video recorder and MMS for sending and receiving photos and videos. It is used for two way communication, helps to disseminate information, improve farmers' knowledge, increases participation and share knowledge with others. The objective of the present study was to know the attitude of farmers towards mobile phone-based agro-advisories (MBAs) on cotton crop. Due to the non-availability of a proper scale to measure the attitude of the farmers towards MBA on cotton crop, it was thought necessary to construct a scale for the purpose of the study. Keeping this in view, an attempt was made to develop a scale. For this purpose method of summated rating scale developed by Likert (1932) was used. Fifteen statements were selected from 25 statements for which t-values were worked out whose values were highest ie with t-values more than 1.75 with equal number of both positive and negative statements.

Keywords: Attitude; mobile phone; scale; cotton

INTRODUCTION

A mobile phone is an information communication technology (ICT) tool used for two way communication. It is becoming one of the basic necessities nowadays for all types of rural and urban people. In recent years, there has been a rapid growth of mobile phone-based agro-advisory services. Hence the study was planned with the objective to find out the attitude of the farmers towards mobile phone-based agro-advisories (MBAs) on cotton crop. For this purpose attitude scale was developed with the help of method of summated rating scale developed by Likert (1932).

Edwards (1957) defined attitude as the degree of positive or negative affect associated with some psychological object. Attitude in this study was operationalised as the degree of positive or negative feelings of cotton farmers towards MBAs on cotton crop.

METHODOLOY and RESULTS

In this study method of summated rating scale developed by Likert (1932) was used to construct the attitude scale of the farmers towards MBAs on cotton crop. Total 41 statements representing the attitude of the farmers towards MBAs on cotton crop were collected initially from various sources viz literature

Table 1. Attitude of the farmers towards mobile phone-based agro-advisories (MBAs) on cotton crop

Statement	Calculated t-value
MBAs will provide timely information to the farmers	1.87*
MBAs will never influence farmers' decision making capability	1.94*
MBAs will provide quality information to the farmers	1.83*
The advises received through MBAs system are of no use	1.89*
MBAs cannot meet location specific needs of the farmers	1.84*
Farmers can get information on remunerative prices of their produce through MBAs	0.98
The advises received through MBAs system may not have practical application to farmers	1.67
MBAs on pest/disease outbreak warning facilitate farmers to take plant protection measures effectively	1.80*
MBAs will give accurate information to the farmers	1.93*
MBAs will reduce the transaction cost of the farmers	2.00*
MBAs provide all possible solutions to present agro-market information needs	0.90
MBAs is a way to help farmers to deal with climate change	1.00
MBAs improve the knowledge level of the farmers on cotton cultivation practices	1.88*
Lack of awareness on MBAs is a barrier for effective usage	1.07
MBAs can be delivered only to latest models of handsets only	0.98
I don't like to use any MBAs in cotton cultivation	1.92*
Mobile handsets facilitate low cost access to information	1.88*
MBAs save travel time of the farmers	1.80*
MBAs enable direct access to information about remote markets	1.15
MBAs can help in getting personalized information even without calling friends/relatives	1.06
The farmers market information needs cannot be satisfied with MBAs	1.84*
MBAs content is trustworthy in nature	1.16
MBAs have positive effect on farm productivity	1.93*
MBAs is the fastest way of information exchange	1.34
MBAs are alternative to the present communication system	1.99*

MBAs= Mobile phone-based agro-advisories, *Selected statement

and interaction with experts and then edited on the basis of criteria suggested by Edwards (1957). Finally 25 statements were selected after the editing. The list of statements is provided in Table 1.

The statements representing the attitude were administered to 60 respondents. They were asked to indicate their degree of agreement or disagreement with each statement on five-point continuum ranging from 'strongly agree' to 'strongly disagree'. The scoring pattern adopted was 5 weight to 'strongly agree', 4 to 'agree', 3 to 'undecided', 2 to 'disagree' and 1 to 'strongly disagree'. For unfavourable attitude statement the scoring pattern was reversed. The responses were recorded and the summated score for the total statements was obtained. For each individual the maximum possible score on 25 statements was 125 and the minimum possible score was 25. The scores of the respondents were arranged in descending order. Twenty five per cent of the highest and 25 per cent of the lowest scores were taken for the item analysis which means 15 respondents from the high group and 15 from the low group were considered. These responses were subjected to item analysis for selection of the items that constituted the final attitude scale. The critical ratio ie t-value, which is a measure of the extent to which a given statement differentiates between the high and low groups of respondents for each statement was calculated by using the formula suggested by Edwards (1957).

$$t = \frac{\overline{X}_H + \overline{X}_L}{\sqrt{\dfrac{S^2_H + S^2_L}{n_H n_L}}}$$

where $\overline{X}_H$ = Mean score on a given statement for the high group, $\overline{X}_L$ = Mean score on a given statement for the low group, S^2_H = Variance of the distribution of the responses of the high group to the statement, S^2_L = Variance of the distribution of the responses of the low group to the statement, n_H = Number of respondents in the high group, n_L = Number of respondents in the low group

$$t = \frac{(\overline{X}_H + \overline{X}_L)}{\sqrt{\dfrac{(\overline{X}_H - \overline{X}_H) + (\overline{X}_L - \overline{X}_L)}{n(n-1)}}}$$

As n_H was equal to n_L (15 each) the modified formula for calculating the t-values of the statements was used. The formula was:

$$(X_H - \overline{X}_H)^2 = \frac{X_{H^2} - (X_H)^2}{n}$$

$$(X_L - \overline{X}_L)^2 = \frac{X_{L^2} - (X_L)^2}{n}$$

After calculating the t-values for all the items of the attitude scale, the values of the statements were arranged in descending order from the highest to the lowest and 15 statements were selected from attitude scale whose values were highest ie with t-values more than 1.75 for both positive and negative statements.

Reliability of attitude scale: According to Kerlinger (1973) reliability is the accuracy or precision of measuring instrument. To know the reliability of the attitude scale, test-retest method was used. The set of 15 statements which represented the attitude of respondents towards MBAs was arranged with the five-point response continuum and was administered to fresh group of 50 respondents outside the sample area. After a period of 15 days the scale was again administered to the same respondents and thus a set of score was obtained. The correlation coefficient for both the sets was worked out which was 0.87 indicating that the attitude scale was highly suitable for administration to the cotton farmers as the scale was stable and dependable in its measurement.

Validity of attitude scale: The validity of the test depends upon the fidelity with which it measures what is expected to measure. The validity of the scale was examined with the help of content validity by determining how well the contents of the scale represented the subject matter under study. As all the possible items covering the universe were selected by discussions with extension experts and experts from research, the present scale satisfied the content validity.

Administration of the scale: The scale thus met the reliability and validity test satisfactorily indicating its ability as an instrument for measuring attitude of cotton farmers towards MBAs. The final selected statements of the scale were administered for the farmers to know the attitude of the farmers towards mobile phone-based agro-advisories on cotton crop.

CONCLUSION

This study was aimed at constructing and validation of a scale to measure the attitude of farmers towards mobile phone-based agro-advisories (MBAs) on cotton crop. The affective aspect of attitude scale consisted of 15 items with high reliability and more predictive validity. This scale can be used in future studies on perceptions and feeling of the farmers towards MBAs on cotton crop. It will be helpful to the policy makers and administrators to develop suitable coping strategies towards farmers by knowing the attitude of farmers towards MBAs on cotton crop.

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