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A scale to measure efficiency of KVK beneficiaries regarding influence of KVK

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Abstract

Efficiency is the convergence of potential in the real and the potential of farmers may be changed after the influence of KVK. This research is conducted in year 2021-2022. So, the study was conducted to develop and standardize a reliable and valid scale to measure the efficiency of KVK beneficiaries regarding the influence of KVK. A summated rating method suggested by Likert (1932) was followed in the development of the scale. A total seventy six statements about influence of KVK on efficiency of KVK beneficiaries were collected. These statements were sent to thirty judges to ensure the relevancy of the statements. On the bases of jury opinion, 52 statements were found relevant. Item analysis of these 52 statements was done. The 't' value of all 52 statements and mean 't' value were calculated. Statements having higher 't' value than mean t values were selected. In this way, a total of 32 statements (having 26 positive and 6 negative statements) were selected for final efficiency scale. This scale was found reliable and valid. It can be used for measuring efficiency of KVK beneficiaries regarding influence of KVK.

Keywords: Efficiency, KVK beneficiaries, item analysis, Likert's summated rating, reliability, relevancy, validity

Introduction

Indian Council of Agricultural Research (ICAR) is an apex organization in the field of agricultural research at the national level which plays a crucial role in promoting and accelerating agricultural research and extension education activities. The ICAR, constituted a committee in 1973 headed by Dr. Mohan Singh Mehta of Seva Mandir, Udaipur (Rajasthan), for working out a detailed plan for implementing this scheme. The Committee submitted its report in 1974. The first KVK, on a pilot basis, was established in 1974 at Puducherry (Pondicherry) under the administrative control of the Tamil Nadu Agricultural University, Coimbatore. ICAR introduced Krishi Vigyan Kendras (KVKs) as a grassroots vocational training centre, it has emerged focal point of technology transfer through its diverse activities like OFT (On-farm trail), FLD (Front line demonstration), capacity building, updating knowledge & skills of extension personnel and farmers.

Nowadays KVKs work very hard to empower farmers and farm youth and increase their efficiency by using the most available resources. Farmers also give well support to KVK for technology transferring. Activities of KVKs whether effective or efficient to the farmers. Thus, under the study for assessing the efficiency of KVK beneficiaries regarding the influence of KVK a reliable scale was constructed.

Methodology

Efficiency has been recognized as an index of performance of the degree of achievement to economic course of action. According to Wyllie (1960) ^[5], efficiency is the capacity or ability of any person, process or thing to reach whatever end desired. Collin (1986) ^[1] meant efficiency as the ability to work well or to produce the right results or the right work quickly and effectively to produce results. Among the techniques available, Likert's technique (1932) of summated rating was used to measure the efficiency of KVK beneficiaries regarding the influence of KVK. Overall methodology summarized in Fig. 1 as below:

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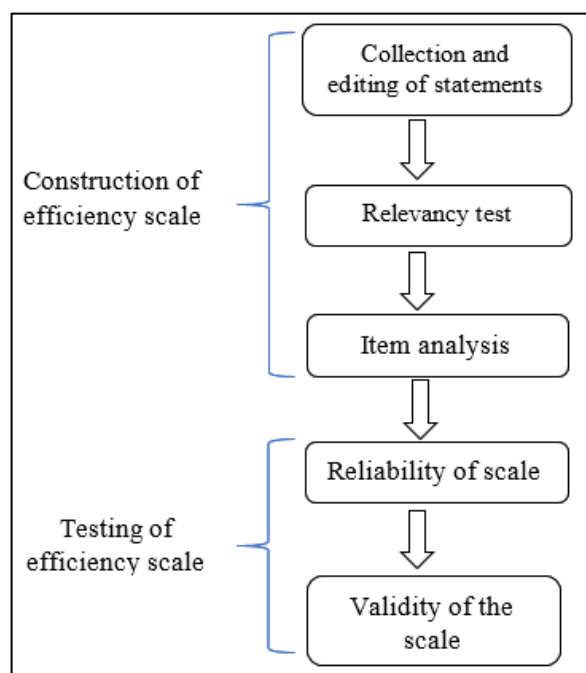


Fig 1: Summary of methodology followed to develop attitude scale

For development of above mentioned scale were considered as following points

1. Collection and editing of statements: A statement may be defined as anything that is said about a psychological object (Yunus *et. al.*, 2017) [6]. Statements are also known as items. In the initial stage of developing the scale, 87 statements reflecting the efficiency of KVK beneficiaries about the influence of KVK were collected from relevant literatures and discussion with extension experts. The sentences in regards were collected from past research and criteria lay down by Edward and Kilpatrick (1948) [2] were used to edit them. Enough care was taken to develop non-ambiguous and non-factual sentences. Finally, 76 statements list was selected.

2. Relevancy test: Total seventy-six statements were sent to thirty judges for ensuring relevancy of statements to check whether each statement was really measuring the efficiency of KVK beneficiaries regarding influence of KVK or not. Responses of judges were collected on a five-point continuum i.e., not relevant, less relevant, relevant, somewhat relevant and most relevant with scores of 0, 1, 2, 3 and 4 respectively and scoring for negative statements was reversed. Judges had liberty to add/remove/modify any of the statements. Mean relevancy score (MRS) for each statement was obtained by the following formula.

$MRS = \text{Total obtained score by particular statement} / \text{Number of judges}$

Statements having more than or equal to a 2.50 mean relevancy score were selected. Thus, based on the jury opinion, 52 statements were found relevant.

3. Item analysis (Calculation of 't' values): Item analysis for all fifty-two statements was done. For this administration, fifty-two statements list were sent to 92 judges comprised of extension experts, professors and social scientists to determine their appropriateness. In all, 80 judges could respond in time. The judges were asked to indicate their

degree of appropriateness or inappropriateness with each statement on five-point continuum ranging from strongly agree, agree, undecided, disagree and strongly disagree. The scoring for positive statements was followed as 5, 4, 3, 2, and 1 and the scoring pattern was reversed i.e., 1, 2, 3, 4 and 5 for negative statements, respectively. Judges had the liberty to add/remove /modify any of the statements. The total score was calculated by summing up the responses on each item.

Based on the total scores, judges were arranged in descending order. The top 25.00 per cent of the judges with their total scores were considered as the high group and the bottom 25.00 per cent as the low group so that these two groups provide the criterion groups in terms of evaluating the individual statements. The 't' values were worked out in order to discriminate the responses of high and low groups for the individual statements by using the under mentioned formula (Edward, 1969) [2]:

$$t = \frac{\bar{X}_H - \bar{X}_L}{\sqrt{\frac{\sum(X_H - \bar{X}_H)^2 + \sum(X_L - \bar{X}_L)^2}{n - (n - 1)}}$$

Where,

$$\sum(X_H - \bar{X}_H)^2 = \sum X_H^2 - \frac{(\sum X_H)^2}{n}$$

and

$$\sum(X_L - \bar{X}_L)^2 = \sum X_L^2 - \frac{(\sum X_L)^2}{n}$$

X_H = Mean score on given statement of the high group

X_L = Mean score on given statement of the low group

$\sum X_H^2$ = Sum of squares of individual scores on a given statement for high group

$\sum X_L^2$ = Sum of squares of individual scores 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

t = Extent to which a given statement differentiate between the high and low group

The obtained 't' value was a measure of the extent to which a given statement differentiates between the high and low groups. After computing 't' value for all the items, the 32 statements having 't' value equal to or greater than 2.101 't' table value were selected. Selected items are shown in table 1 with its 't' value.

4. Reliability of scale: A scale is reliable when it gives consistently the same results when applied to the same sample. The designed efficiency scale for the study was tested for its reliability by using the split half method. It was introduced to 20 KVK benefited farmers of non-sample area. Co-efficient of reliability between these two sets of scores was calculated by Rulon's formula (Guilford, 1954) [3].

$$rtt = 1 - \frac{\sigma^2_d}{\sigma^2_t}$$

Where,

R_{tt} = Coefficient of reliability

$\sigma^2 d$ = Variance of those differences

$\sigma^2 t$ = Variance of the total scores

The coefficient of reliability between two sets of scores was found to be 0.8283 which was found to be significant at 1 per cent level of significance.

5. Validity of the scale: Validity is the consistency of a measuring instrument. 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 efficiency of KVK beneficiaries about the influence of KVK was thoroughly covered through literature, expert advice, judges' opinion, etc., it was assumed that the 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 efficiency. Thus, ensuring a fair degree of content validity.

Results and Discussion

Seventy-six statements of efficiency about the influence of KVK were gathered, edited, framed and provided to thirty judges for ensuring the relevancy of the statements. On the bases of jury opinion, 52 statements were found relevant. After item analysis of selected 52 statements, a total of 32 statements (having 26 positive and 6 negative) were selected for final efficiency scale. The selection of statements across phases during efficiency scale construction is depicted in Fig 2. The reliability and validity of the efficiency scale were assessed. Thus final efficiency scale consisted of 32 statements. It is mentioned below together with their corresponding t value in table 1.



Fig 2: Selection of statements for efficiency scale construction

Administering of efficiency scale of KVK Beneficiaries Regarding Influence of KVK

The efficiency of KVK beneficiaries regarding influence of KVK had to be measured. In this regard, list of 32 selected statements are placed below. You are asked to express their reaction in terms of their agreement or disagreement with each item by selecting one of five response categories. You are requested to put (✓) mark in suitable option given against each statement. The responses were 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 total efficiency score for each respondent was obtained by adding all the scores of their responses to all the statements and were grouped into three categories. The efficiency scores on this scale range from 32 to 160. The higher score indicated that respondent had high efficiency about influence of KVK.

Table 1: Selection of statements to measure the efficiency of KVK farmers regarding the influence of KVK

Note: SA: Strongly Agree, A: Agree, UN: Undecided, DA: Disagree and SD: Strongly Disagree							
Sr.	Statements	't' value	Degree of agreement or disagreement expressed by the statements				
			SA	A	UD	DA	SDA
1.	I think the reduction in farming costs is due to the good information provided by KVK.	4.92					
2.	I use to regular contact with KVK scientists to get information.	4.81					
3.	KVK scientists teach us to be task-oriented.	4.58					
4.	Productivity gains under front-line demonstrations (FLDs) create awareness among farmers.	4.20					
5.	Quality technological products (seeds, planting materials, bio-agents, livestock) from KVK are readily available to farmers.	4.20					
6.	The training provided by KVK is relevant to my needs.	4.04					
7.	I try to use mobile application for getting information from KVK scientist.	3.83					
8.	KVK training improved self-confidence among farmers.	3.79					
9.	Communication skills can be improved in group discussions.	3.67					
10.	*Front-line demonstrations are the worst task functioning.	2.41					
11.	One have to make regularly try to complete task through practice.	3.54					
12.	Farmers are devoting time to their time in KVK activities.	3.49					
13.	I do not hesitate to make decisions regarding farming.	3.39					
14.	KVK provides skill-based training to farmers for generating income from the business.	3.35					
15.	Method demonstration gives opportunity to learn skills and practical knowledge of the subject.	3.25					
16.	KVK encourages farmers to experiment on their farms.	3.25					
17.	The influence of KVKs activities has substantially increased crop production.	3.22					
18.	I easily adapt myself to the new environment.	2.97					
19.	I regularly try to view SMS sent by KVK for more activities.	2.89					
20.	Vocational training provides employment opportunities to the farmers.	2.83					
21.	The right way of fertilizer application to the crops sustains in the crop production.	2.74					
22.	KVK activities help in decision-making ability.	2.72					
23.	*One need not consult with the Subject Matter Specialist (SMS) for crop planning.	2.60					
24.	*It is not necessary to make a prior decision about adopting new technology.	2.57					
25.	Successful front-line demonstration (FLD) develops confidence among the towards new technologies.	2.47					
26.	*When I want to adopt new technology, I am afraid of failure.	2.45					
27.	Practices-oriented activities enhance the knowledge of farmers.	2.38					
28.	*KVK provides limited market information to farmers.	2.30					
29.	*KVK training fails to impart knowledge about new technology to farmers.	2.23					
30.	Arranging field day at a mature stage of crop improve the knowledge.	2.21					
31.	I always enforce plant protection measures.	2.19					
32.	I do not adopt any other technology except KVKs suggestion.	2.11					
*indicates negative statement							

Conclusion

The efficiency scale consists of thirty-two statements about influence of KVK. Efficiency scale needful for KVKs to measuring farmers efficiency. This scale may be useful for researchers to get feedback. It will also be guide for policy makers, planners & administrators to develop strategies to improve KVK's operations. This scale can also be used to measure the farmers' efficiency about influence of KVK with suitable modifications.

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