A Standardised Knowledge Test to Measure the Extent of Knowledge of Agricultural Extension Personnel on m-tools

N. Kusuma Kumari[1] and A. Sakeer Husain[2]

Agricultural extensionists act as direct link between the researchers and the farmers. In order to perform their role effectively and efficiently, they must have steady access to updated agricultural information. The basic problems in attaining access to updated information are lack of awareness, knowledge and attitude of the extension personnel. Thus, there is a need to assess the knowledge of extension personnel on advanced ICT tools such as mobile telephony and its role in agriculture. Moreover, no such studies were reported showing a research gap in this context. Considering this, a study was undertaken with the objective of developing a standardised teacher made test for measuring the extent of knowledge of Agricultural extension personnel on m-tools.

METHODOLOGY

Initial attempt was to prepare knowledge items that were found suitable for measuring the knowledge of agricultural extension personnel on m-tools. For assuring the content validity, thorough review of relevant literature and discussion with experts were carried out for the purpose. Accordingly, 34 knowledge items were prepared. After making necessary modifications, a total of 30 items were screened out.

For standardising the selected items, the procedure suggested by Anastasi (1961) and followed by Srinivas *et al.* (2014) and Naveenkumar and Sendilkumar (2015) was adopted.For this purpose, 30 agricultural extension personnel *i.e.*one Agricultural officer and one Agricultural assistant from 15 *Krishibhavans* (the grass root level agricultural development offices in Kerala) were selected randomly from Thrissur district of Kerala. The *Krishibhavans* were also selected on a random basis.

The 30 knowledge items were administered to the selected 30 agricultural extension personnel and their responses were taken into count for calculating the difficulty index and discrimination index of each item.

1. PG Scholar, Department of Agricultural Extension, College of Horticulture, and 2. Associate Professor (Agrl. Extension), and Institutional Co-ordinator, Centre for e-Learning, Kerala Agricultural University, Thrissur.

Scoring Pattern

The respondents were asked to indicate their responses to each item in the knowledge test, and the correct answers were assigned a score of '1' and incorrect answers a score of '0'. The total knowledge score for each item was calculated by summing up the scores given by all the respondents to the item. Based on this, the difficulty index and discrimination index were calculated as detailed below.

Difficulty Index (P)

The difficulty index indicates the extent to which an item is difficult. An item should not be too easy, that all persons can answer it, nor should it be too difficult that none of them can answer it. The item difficulty index P,was worked out in this study as the percentage of respondents giving correct response to an item. It was calculated using the formula

$$P = \frac{NC}{N} \times 100$$

Where, P = Difficulty index, NC = Number of respondents who answered correctly and N is total number of respondents.

The range is from 0 to 100 per cent. Higher the value easier is the item. P values above 80 are very easy items and these are not test worthy. P values below 20 indicate difficult items and should be reviewed for possible corrections and alterations. Optimum difficulty level is 50 for maximum discrimination between high and low levels of knowledge. In the present study, the items having P values between 20 and 80 were considered and included in the final knowledge test.

Item Discrimination

Item discrimination or the discriminating power of a test item refers to the degree to which success or failure of an item indicates possession of the ability being measured (Singh, 2013). It determines the extent to which an item discriminates the respondents in terms of the ability that the item measures. For calculating the discrimination index, respondents with the highest and least scores were identified and for each item it was calculated based on the proportion of respondents that gave correct responses. This value ranges between -1.00 and +1.00. Higher the value more is the discrimination power of the item. Item discrimination is calculated using the formula

$$E^{1/3} = \frac{(S1) - (S3)}{N/3}$$

Where E= Discrimination Index, S1 and S3 are the frequencies of correct responses of the items in upper and lower groups of respondents respectively, N= Number of total respondents

Items having negative discrimination are rejected. Items having

discrimination index above 0.10 were selected for the final knowledge test as followed by Barman and Kumar (2010).

Findings and Discussion

By following the item analysis procedure as mentioned in the methodology item difficulty index and discrimination index were computed. The items constructed with the indices obtained are given in Table 1

Table 1. Difficulty and Discrimination Indices of the Knowledge Items

Sl.No	Item	Difficulty index	Discrimination index
1.	Name one m-app that provides weather information_____(Any app providing weather information)	26.67*	0.1*
2.	Name one m-app that provides market price information of agricultural commodities _____(Any app providing market price)	56.67*	0.7*
3.	There are m-apps that provide agricultural technology information also. Yes/No (Yes)	93.40	0.2
4.	Updating the already installed app on mobile is a paid service.Yes/No (No)	90.00	0.1
5.	The toll free number for Kisan Call Centre of Government of India is _____(1800-180-1551)	34.61*	0.2*
6.	m-apps can be given a rating on 5-star scale. Yes/No (Yes)	100.00	0
7.	What is the mode of information delivery through m-kisan? _____(SMS,IVRS, Mobile app)	60.00*	0.7*
8.	As of now there are no m-apps in local (Malayalam) language. Yes/No (No)	56.62*	0.2*
9.	The mobile app developed by KVK, Malappuram_____(FEM@Mobile)	84.00	0.4
10.	The term "App" is the shortening of the term _____(Application)	100	0

11.	All m-apps available in agriculture are paid services. Yes/No. (No)	86.67	0.4
12.	There is a chance that some apps can be malwares. Yes/No (Yes)	83.34	0.1
13.	Queries can be sent to kisankerala through SMS service. Yes/No(Yes)	70.00*	0.4*
14.	All the available m-apps are location specific. Yes/No (No)	70.00*	0.8*
15.	IVRS is one of the modes through which m-apps provide visuals and graphics. Yes/No (No)	43.34*	0.7*
16.	Agriculture related banking services are not possible through m-apps Yes/No(No)	61.54	-0.1
17.	The m-app once installed can be uninstalled easily. Yes/No (Yes)	93.34	-0.1
18.	Google play store is the only app store for all types of mobiles. Yes/No (No)	66.67*	0.3*
19.	Mobile apps are software programs that one can download and access directly using a phone. Yes/No (Yes)	96.67	0.1
20.	For installing an app from app store it is not compulsory to accept the terms and conditions provided. Yes/No(No)	70.00*	0.4*
21.	Guest user facility is available for using m-apps. True/False (True)	66.67	-0.1
22.	Once an app is installed on mobile it automatically collects location data. Yes/No (No)	36.67*	0.5*
23.	Name one m-app that provides technical information on agriculture _____(Any app that provides technical agricultural information)	79.62*	0.3*

24.	Which of the following provides daily market price of agricultural commodities? a) Digital mandi b) my RML c) Gram seva d) All the above. Ans: (d)	36.67*	0.1*
25.	There is a provision for providing reviews/comments about the usefulness/improvement of the app. Yes/no (Yes)	100.00	0
26.	An m-app can provide information on one particular aspect only. Yes/No (No)	70.00	-0.2
27.	Information about last update of each app is available. Yes/No (Yes)	70.00	-0.6
28.	Which of the following web portal provides mobile SMS service in agriculture? a) m-kisangov.in b) kissankerala.net c) celkau.in d) Both a&b Ans: (d)	40.00*	0.1*
29.	The information content in m-apps is available in English only. Yes/No (No)	60.00	-0.1
30.	As of now, there are no m-apps that promote organic agriculture. Yes/No (No)	16.67	-0.1

*Indicates the items that are retained for the final knowledge test

As seen in Table 1,there are only three items that were answered by all the respondents which showed zero discrimination power and a difficulty index of 100. In addition, there were nine items having difficulty index greater than 80. Thus, a total of 11 items were found very easy by the respondents to answer, among all the items listed, which showed a poor discrimination index. Only one item showed a difficulty index of 16.67 which indicates high difficulty of the item for respondents to answer. As mentioned in the methodology only the items having discrimination index greater than 0.1 were selected. Thus, 14 such items were identified to be included for the final knowledge test.

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