

STANDARDIZING KNOWLEDGE TEST

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ABSTRACT

It has been of paramount importance that the students, research scientist, extension scientists as well as field extension functionaries must possess knowledge and understanding of standardizing knowledge test that can be used for various extensions education purposes. Technique for the same is explained through the present research study. Very limited works have been done for standardizing the knowledge test. Such tests are very common in western countries, particularly in U.S.A., where they are very helpful in selecting candidates for admission to various classes in the universities and colleges. They also help to bring about uniformity in the academic excellence of students throughout the country. Serious and concerted efforts should be made in India also for standardizing knowledge test.

Key words : Standardizing; Knowledge Test; Item Difficulty; Item Discrimination; Point-Biserial (rpb);

INTRODUCTION

Standardizing the knowledge test is not very common in our country for finding out the knowledge through knowledge test. Therefore, keeping this objective, a standardized test for undergraduate students in agriculture for testing their knowledge of extension education was developed. The Extension Education syllabus prescribed by the Maharana Pratap University of Agriculture and Technology, Udaipur (Rajasthan) for B.Sc. (Ag.) Part-III was used. Respondents to the preliminary test were the Final year students of B.Sc. (Ag.) who were taught Extension Education during the year 2003-04.

METHODOLOGY

The study was conducted at Rajasthan College of Agriculture, Maharana Pratap University of Agriculture and Technology, Udaipur, Rajasthan. The following steps were followed in standardizing the knowledge test:

1. *Item's Selection* : Covering all aspects of the syllabus, a 'true and false' type test comprised of 90 items was developed. While making the items, care was taken to see that they were based on the knowledge, which the students should possess after they have been taught all of the prescribed syllabus. Also, every effort was made to see that the sentences were simple, easily understood and each had only one idea. Equal number of positive and negative sentences (45 each) were randomly mixed.

2. *Preliminary Administering the Test* : The test was administered to 48 students of B. Sc. (Ag.) Final Year class of Rajasthan College of Agriculture, Maharana Pratap University of Agriculture and Technology. They were asked to read each sentence carefully and record their responses by encircling either 'T' or 'F' which represented 'true' and 'false' statement respectively.

3. *Test Paper Scoring* : In case of positive sentences, true response was given a score of one and the false response

zero; whereas in case of negative sentences this order was reversed. Thus, a composite score was obtained for every respondent and for every test paper. These scores were subjected to item analysis comprised of item difficulty and item discrimination.

4. *Finding Item Difficulty* : The difficulty of an item is the proportion of individuals who answer an item correctly. Basically, item difficulty is the result of dividing the number who answers the item correctly by the number who took the test. This multiplied by 100 would give item difficulty in percentage. From the view point of item difficulty, a well made test starts with a few very easy items, continues with the items of increasing difficulty and ends with a few item which only a very few of those taking the test could answer correctly. There would be more difficulty values clustering about the centre than at either extreme; but there would be a balance so that the average item difficulty is around 50 percent.

On the basis of above criteria, the below mentioned items with extreme item difficulty percentages were discarded from the test. The cutting points arbitrarily chosen were 95 and 10 for high and low scores respectively.

The remaining 76 items with moderate difficulty percentages were however, retained in the test and were subjected to item discrimination test.

5. *Item Discrimination* : The purpose of item discrimination is to spread-out the individuals taking the test. The item, which separates good respondents from poor ones, is said to discriminate. The discrimination index is a measure of how well the item separates the two groups.

There are two general ways of demonstrating item discrimination - (i) a test of the significance of the difference and (ii) a co-relational technique. The latter method was adopted in the present case.

In the co-relational approach to item analysis, a co-relation co-efficient is computed that shows the relationship of response to the total test scores. In other words, we are

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investigating how well the item is doing what the test itself is doing.

A method using all of the papers was adopted. We set up a distribution of scores on the Y axis of our scatter plot, and since the test item is scored on a right or wrong basis, we have only two categories on the X axis.

We took the first paper, noted the total score and whether or not the item was answered correctly and tallied the item at the appropriate place on the frequency distribution. Then the next paper was taken, the response tallied, and this process was continued for all of the papers. When the tallying was finished a Point-Biserial (rpb) was computed using the following formulas :

Where
$$\sqrt{rpb} = \frac{\bar{X}_p - \bar{X}_t}{St} \frac{P}{q}$$

\bar{X}_p = the mean score of those answering the item correctly.
 \bar{X}_t = the mean of the total scores.
 St = Standard deviation of the test.

P = Proportion of the total group answering the item correctly.

Q = 1-p

** To set the significance of the Point-Biserial Co-relation co-efficient the following 't' test was used.

$$t = \frac{Rpb\sqrt{N-2}}{\sqrt{1-rpb^2}}$$

The resulting co-efficient is a product moment correlation co-efficient and is used and interpreted just as the Pearson 'r' is.

It is obvious that out of 76 sentences, 15% found significant even at 0.1 alpha-level, showing thereby their low discriminating power. The sentences are, then, to be rejected and the remaining 61 sentences to be retained in the final test.

6. *Reliability of the Test* : The Sperman Brown split-half reliability method was applied to the responses of 43 students taking the test. The sentences in the scored paper were split into two halves on the basis of odd and even numbers and their scores added up. Thus, from every single paper two sets of scores were found to be 0.54 which was reasonably good showing thereby that the test was reliable.

Table 1. Items Discarded from the Test

S.No.	Sentences	Scores
1.	Extension Education aim is to bringing about desirable changes in knowledge, attitudes and skills of the rural people.	96
2.	Extension teaching to be effective requires a combination of teaching methods.	99
3.	Good communication is the essence of good teaching.	98
4.	Extension teaching is more effective when the presentation is supplemented by well-developed A.V. aids.	98
5.	Group discussion is a co-operative method for collecting and analyzing facts and then making decision on matters of common interests.	96
6.	The speed of learning is reduced but the learning ability remains same with decline in age.	96
7.	Extension teaching must be based on people's need.	95
8.	Community development program of India is an integral part of five years plans of the country.	95
9.	Extension teaching and classroom teaching between them.	95
10.	It is i.e. extension education is an out of school education for youth and adults.	98
11.	In conduction of the demonstration, selection of site of demonstration is very important.	97
12.	Programme Planning in extension education is based on the analysis of facts.	96
13.	Decision-making in extension education at village level should be based on common interest and peoples need.	96
14.	To examine the strong and week points evaluation in extension education is highly essential	97

7. *Validity of the Test* : For testing the validity the same test was administered to 8 M. Sc. (previous and final) students of extension in the Department of Extension Education, Rajasthan Collage of Udaipur, validity was calculated by comparing the score of B. Sc. and M. Sc. students. The Mann whiteny U-test yielded a significant result at .05 level of significance. The M. Sc. student scored significantly higher then B.Sc. (Ag) final year student. Since this test was significant in the direction which one could logically expect, the test was considered valid.

RESULTS AND DISCUSSION

The results of this study indicated that in standardizing knowledge test all the items included in the knowledge test are not statistically correct to be included in the test. Out of the total 90 items included in this study, 14 items were discarded (Table 1) and only 76 items (Table 2) were retained.

The items which were retained in the knowledge test are presented in Table 2.

Table 2. The Point-Biserial (rpb) values of the 76 Items retained in the Knowledge Test

S. No.	Sentences	rpb value
1.	The only aim of extension work is to increase agricultural production.	0.27 P<0.05
2.	Participation of people in extension work is not necessary.	0.20 P<0.1
3.	Extension work is a cooperative enterprise between government officials and rural people.	0.20 P<0.1
4.	It is not necessary to combine research, teaching and extension in the process of rural development	0.42 P<0.001
5.	Extension is an one way channel through which flows the scientific information from the research station to the farming people.	0.27 P<0.05
6.	Extension Education leaves the ultimate decision up to the individual whether to adopt or reject a new practice.	0.19 P<0.1
7.	Extension work is a government programme with people's participation.	0.18 P<0.1
8.	India's extension service will have to be abolished when the country has attained self-sufficiency in food.	0.30 P<0.01
9.	Extension work is an applied science.	Non significant
10.	Extension work is merely providing farmers with supplies and services needed for increasing agricultural production.	0.43 P<0.001
11.	Three types of filmstrips commonly used in extension work are - (a) single frame (24x48); (b) double frame (36x24); and (c) triple frame (60x45).	0.30 P<0.01
12.	John Dewey devised cone of experience in teaching learning process.	Non significant
13.	Learning is a process by which a person brings changes in his behaviour through self-activity.	Non significant
14.	There is no difference between the adult and child-learners.	Not significant
15.	The students learn through the activities of the teacher.	0.30 P<0.01
16.	Flash cards and flannel graphs are generally used in mass meetings.	0.04 P<0.001
17.	Poster presents one or more ideas in detail but with simple words.	0.44 P<0.001
18.	In all teaching situations Sound Film Projector fits better than film strips or slides.	0.21 P<0.1
19.	A silent motion picture film can be run on a sound projector, but a sound film can never be run on a silent projector.	Non significant
20.	Group discussion is only a source of recreation to the rural people.	0.28 P<0.05
21.	The most popular types of lantern slides used these days are of two sizes - 2"x2" and 3 1/4 "x4".	Non significant
22.	Even without education unfelt needs can be changed into felt needs.	0.20 P<0.1
23.	The five elements of learning situation are (i) teacher (ii) learner, (iii) subject matter, (iv) teaching materials and (v) physical facilities.	Non significant
24.	Extension teaching and learning must deal with ideas that have utility value and immediate use.	Not significant
25.	Right kind of learning activities engages maximum number of senses.	0.32 P<0.05
26.	Result demonstration usually involves one or more method demonstrations.	0.19 P<0.1
27.	Changes in fundamental attitude develop very slowly.	0.25 P<0.05
28.	Participant in extension education programme usually make up a homogeneous group in respect of age, education, needs and attitudes.	0.20 P<0.1
29.	People are motivated to learn if they can satisfy their basic needs through learning.	Non significant
30.	In the 'Cone of experience' the step 'contrived experience' refers to learning by actual doing.	Non significant
31.	In extension teaching mass contact is considered more effective than individual contact.	0.34 P<0.01
32.	35 mm. films are usually used for educational movies in extension work.	Non significant
33.	Individual teaching methods are more effective but also are more expensive than other methods.	0.17 P<0.1
34.	Motion pictures and filmstrips are the same except difference in their sizes.	0.17 P<0.1
35.	The Extension Service in U.S.A. is known as the Co-operative Extension Services.	Non significant
36.	The rural development started by poet R.N. Tagore is popularly known as 'Marthandom Experiment'.	0.29 P<0.01
37.	One of the major shortcomings in the early Extension work in India was that the people were not properly involved in it and the programmes were almost imposed upon them.	0.17 P<0.1
38.	Etawah Pilot Project was started in 1948 with the active assistance of Dr. Spencer Hatch.	0.33 P<0.01
39.	Smith Lever Act of 1914 proposed to establish Land Grant College in U.S.A.	0.24 P<0.05
40.	Mr. Albert Mayer started Gurgaon Project in 1932.	0.36
41.	The administrative pattern of C.D. programme in India is just a replica of the Co-operative Extension Service in U.S.A.	0.20 P<0.1
42.	The C.D. Programme in India aims at bringing about an all round development of villages in a planned democratic way.	0.35 P<0.01

43.	The first Rural Community Projects in India were started in 1952.	Non significant
44.	In India Community Development is the 'means' and Extension Education is the programme for attaining rural development.	0.63 P<0.001
45.	Nilokheri experiment was started by S.K. Dey to rehabilitate displaced persons from Pakistan.	0.24 P<0.05
46.	National Extension Service (NES) was started in 1962.	0.25 P<0.05
47.	The two basic elements of C.D. programme are people's participation and self-help.	0.24 P<0.05
48.	The man associated with starting 'Marthandom Project' was Mr. V.T. Krishnamachari.	0.24 P<0.05
49.	Demonstration as a teaching technique was used first by Butterfield Kenyon in 1910 in U.S.A.	0.19 P<0.1
50.	Panchayati Raj has been designed for the benefit of the stronger section of the community.	0.24 P<0.05
51.	The organizational structure of Panchayati Raj is different in different States.	0.36 P<0.01
52.	Panchayati Raj is the Indian name for three-tier administration under democratic decentralization.	0.19 P<0.1
53.	The Zila Parishads play a Key-role in the implementation of Panchayati Raj.	0.25 P<0.05
54.	The three tiers of Panchayati Raj are the villages, the co-operative and the village school.	0.26 P<0.05
55.	Panchayati Raj is the agency through which the C.D. programme is to be carried out.	0.25 P<0.05
56.	There is no provision of subsidy to cooperative farmers under National Demonstration Scheme.	0.27 P<0.05
57.	I.A.D.P. is popularly known as Package Programme.	0.36 P<0.01
58.	National Demonstration is a scheme launched by Central Government to increase agricultural Production.	0.22 P<0.05
59.	I.A.D.P. in India was started in 1968.	0.19 P<0.1
60.	It is not necessary to sow High Yielding varieties of seeds in National Demonstrations.	0.52 P<0.001
61.	If National Demonstration becomes successful throughout the country, there will be no further necessity of Extension workers.	0.38 P<0.001
62.	The basic principle underlying Package Programme was to provide farmers all supplies and services at the right time and in adequate quantities.	0.23 P<0.05
63.	Only small farmers should be selected for National demonstration.	0.19 P<0.1
64.	There are three subject matter specialists for each intensive district under National Demonstration.	0.29 P<0.01
65.	The principal duty of Village Level Worker (VLW) is to supply agricultural inputs to the farmers.	0.24 P<0.05
66.	To develop leadership among rural people is not the duty of extension worker.	0.22 P<0.05
67.	An extension worker should base his teaching on the felt needs of his clients.	0.18 P<0.1
68.	Bachelor's Degree in Agriculture is preferable for would be extension worker.	Non significant
69.	An extension worker must possess leadership qualities.	Non significant
70.	In-service training programme for Extension workers should be related to local needs and problems.	0.35 P<0.01
71.	Rural background is not desirable for an Extension worker.	0.23 P<0.05
72.	Previous teaching experience is helpful for would be Extension worker.	0.25 P<0.05
73.	Extension Programme must be based on the needs and interest of the local people.	0.19 P<0.01
74.	Extension Programme must be rigid and unchangeable.	0.31 P<0.01
75.	The step following teaching plan is 'Reconsideration' in the cycle of programme planning.	0.27 P<0.05
76.	It is not possible to convert unfelt needs to felt needs by extension teaching.	0.19 P<0.1

CONCLUSION

The findings of the study revealed that all the questions included in the knowledge test in order to find out the knowledge of the participants without standardizing the

knowledge test does not give the statistically correct knowledge score of the participants. It implies that the knowledge test must be standardized as discussed in this study for accuracy of results.

REFERENCES

1. Bajpai, S.R. (1976), Methods of Social Survey and Research, Kanpur: Kitab Ghar, Acharyanagar.

