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Development of scale to measure the knowledge of rural and urban high school students about agriculture

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Abstract
For studying the knowledge of rural and urban high school students about agriculture, it was decided to develop scale as a device to measure the knowledge of rural and urban high school students about agriculture about seven different areas like social information, public policy in agriculture, environment and natural resources, plant science, animal science, processing of agricultural Products and marketing. The criteria were collected after reviewing the related literature and thorough discussion with the experts in the fields of agricultural extension, Economics, Plant science, Animal science, Post harvest technology, Agronomy, Horticulture and Soil science. Appropriate statistical methods. 'scale product method' was used, A battery of 81 items was drafted for judgment; a panel of 100 judges was requested to assign the score for each statement in three point continuum viz., 'most relevant', 'relevant' and 'not relevant' with scores of 2, 1 and 0, respectively, based on the scale (median) 30 statements were finally selected to constitute scale to measure the knowledge of rural and urban high school students about agriculture The statements were edited based on 14 criteria suggested by Edward (1969) [1].

Keywords: Knowledge scale, rural and urban high school students and agriculture

Introduction
"Agricultural literacy is important to the future of our nation and the discipline of agriculture". Because, the majority of the public has now almost completely in their daily lives removed from agriculture, it is of utmost importance that best practices in agricultural education are identified to ensure agricultural literacy is maintained in future generations of Indians. The methods used to present agricultural education to students can greatly influence students' attitudes towards learning material. (Sutphin, 1990) [3] stated that the quality of a school garden or agricultural learning material is the single most important factor influencing the knowledge, skills, and attitudes of youth learning about agriculture. Research has articulated the positive benefits of agricultural education programs for individuals in a variety of situations, such as nursing home residents, prison inmates, hospital patients, and disabled individuals, and hands-on experiences with agriculture have been shown to create a significant increase in a student's knowledge. The need to provide students with sound agricultural knowledge is imperative as these students' choices will assist in the development and implementation of public policy. The urban agricultural education program has made and continues to strive to meet the needs of educating students about agriculture. The urban program must teach to its students what rural students take for granted personal and interactive experience with agriculture throughout their lives (Gless, 1993) [2]. Emphasizing career opportunities in agriculture, the urban program should provide SAE opportunities within the community, promoting how agriculture impacts them. Although many people may feel that an agriculture program is not appropriate for an urban setting, there are numerous opportunities here for SAE, career sites, and other hands on experiences (Sutphin, 1990) [3]. These work and classroom experiences and opportunities aid in developing agricultural literacy and promoting sound agricultural choices.

Materials and Methods
For developing scale as a device to measure the knowledge of rural and urban high school students about agriculture about seven different areas like social information, public policy in agriculture, environment and natural resources, plant science, animal science, processing of agricultural Products and marketing. The criteria were collected after reviewing the related literature and thorough discussion with the experts in the fields of agricultural extension, Economics, Plant science, Animal science, Post harvest technology, Agronomy, Horticulture and Soil science. A battery of 81 items was drafted. The statements were edited based on 14 criteria suggested by Edward (1969) [1].

In editing and pre selection of items, the 81 statements were then subjected to scrutiny by an expert panel of judges to determine the relevancy. Based on 60 judges' responses of these judges, the scoring and analysis of the items was done. The responses were obtained on three point continuum viz., 'most relevant', 'relevant' and 'not relevant' with scores of 2, 1 and 0, respectively.

Item analysis

The statements were administered to 40 students from non-sample area. For item analysis, 't-test' was used. The respondents were arranged in ascending order on the basis of total score earned by them. Then 25 per cent respondents with highest total score and 25 per cent with total lowest score were selected. These two groups provided the criterion groups for item analysis. The critical ratio (t) for each item was calculated by using following formula.

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

The 't' value equal to or greater than 1.75 indicate that the average response of high and low group differs significantly and differentiates between high and low groups. Finally the statements having 't' value greater than 1.75 were selected.

Validity of the scale

Validity of the scale is that ensures that obtained test scores measure the variable is supposed to measure.

Reliability of the scale

A scale is said to be reliable when it consistently produces the same results when applied to measure the same phenomenon from time to time. For this study test-retest method of reliability was used.

Test retest method:

The knowledge scale with items as developed was administered to the 20 students who were neither previously interviewed nor had chance to come in the final sample. After period of 15 days the same 20 students were given the test. Two sets of scale score were thus obtained. Each of the two sets of statements was treated as a separate scale and then these two sub-scales were correlated. The coefficient of reliability was calculated by the Rulon's formula which came to 0.8219. Thus, the scale developed was found highly reliable.

Administering the developed scale

The respondents were asked to express their response in terms of yes or no with regard to each of the 30 items included in the scale. The responses were collected in two point continuum. Score 1 was allotted to 'yes' statements and zero score to 'no' response. Thus, the total score one could obtain ranged from 0 to 30 as 30 statements were included in final scale. The score for each respondent was obtained by summation of score of each one of the statements included in the scale. The information pertaining to developing scale to measure the knowledge of rural and urban high school students about agriculture is given in Table 1.

Table 1: The information pertaining to developing scale to measure the knowledge of rural and urban high school students about agriculture is given in Table.

Sl. no.	Concept areas	MR	R	NR
A	**Social information**			
1	62% of the Indian population depends on agriculture.			
2	India ranks second in worlds population.			
3	Barter system is most common in rural life.			
4	Agriculture is the oldest and most widely adopted occupation of human.			
B	**Public polices in agriculture**			
1	Mahila samridhi yojana provide economic security to the rural women.			
2	Agricultural polytechnic provides agriculture education to the students.			
3	At present there are 4 agricultural universities established in Maharashtra state.			
4	The Right to Information Act was passed in the year 2005.			
5	Night school was started by govt. to educate adult people.			
C	**Environment and natural resources**			
1	Environment refers to the surrounding of organism in which they live and interact.			
2	Sun is a great source of energy without any pollution.			
3	Gobar gas is the fruitful solution to the present day- environmentally clean technology.			
4	Drip irrigation is very effective and efficient tool of irrigation.			
5	Pollution refers to the unwanted dirt and waste that spoils land, water and air.			
D	**Plant science**			
1	Basic unit of life is cell.			
2	Moisture and temperature are two limiting factors of plant growth.			
3	Every plant needs an optimum temperature for germination, growth and reproduction.			
4	In plants the energy is produced during respiration.			
5	The water in the plants is transported by xylem.			
E	**Animal science**			
1	Milk is the second largest agricultural commodity next to rice.			
2	Livestock rearing is mostly done by women.			
3	Animal husbandry is the great source of employment to the rural people.			
4	Phule Triveni is the triple cross hybrid cow developed by Mahatma Phule Kishi Vidyapeeth, Rahuri.			
F	**Processing of agricultural products**			
1	Ethylene is an ripening hormone.			
2	Mango is the rich source of vit. A.			

3	Freezing is the latest technique in food preservation.			
G	**Marketing**			
1	Human wants are unlimited.			
2	Primary agriculture co-operative society are functioning at village level.			
3	Agriculture sector is the main source of supply of food and fodder.			
4	AGMARK is associated with quality of agricultural products.			

MR: Most relevant R: Relevant NR: Not relevant

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