

International Journal of Statistics and Applied Mathematics

ISSN: 2456-1452
Maths 2023; SP-8(4): 745-748
© 2023 Stats & Maths
<https://www.mathsjournal.com>
Received: 08-06-2023
Accepted: 10-07-2023

Amit Kumar
Department of Extension
Education, CCS, Haryana
Agricultural University, Hisar,
Haryana, India

Dr. Ashok Kumar Godara
Department of Extension
Education, CCS, Haryana
Agricultural University, Hisar,
Haryana, India

Rati Mukteshwar
Department of Extension
Education, CCS, Haryana
Agricultural University, Hisar,
Haryana, India

Corresponding Author:
Amit Kumar
Department of Extension
Education, CCS, Haryana
Agricultural University, Hisar,
Haryana, India

Psychometric analysis to measure the students' attitude

Amit Kumar, Dr. Ashok Kumar Godara and Rati Mukteshwar

Abstract

In the present study, attempt was made to develop an instrument to measure the attitude towards Rural Agriculture Work Experience (RAWEP) Programme. The methods of summated rating scale suggested by Likert (1932) and Edwards (1969) were followed to develop an instrument. For the sample size different colleges were selected *viz.* Department of Extension Education, Agriculture Economics, Directorate of Extension Education from the CCS Haryana Agricultural University, Hisar. For the data collection pre-testing of questionnaire was done by 20 concern specialist. Thereafter, 25 items were selected to know the opinion of interviewer. Out of 25 items one item (Item 8) was found ambiguous in the questionnaire. Questionnaire was analysed using Cronbach's alpha test. The instruments provided value of Cronbach's alpha.744 and standardized value.725 were found above 0.6 that indicates highly acceptable. Hence, instrument was found adequate for batter comprehension which efficient to measure the attitude of students'.

Keywords: Attitude, Cronbach's alpha, dimensionality, RAWEP, scale and questionnaire

Introduction

Agriculture education is a dynamics filed that is changing in frequent manager to meet the need of the society. The students of agriculture are taught well regarding basic and applied aspects of science and technology. Keep in view of these need the directives of ICAR, university introduced the unique programme of Rural Agriculture Work Experience (RAWEP). Under this programme students are exposed to natural setting of village situation. In fact RAWEP is learner centred approach of exposing undergraduates by using principle of "learning by doing" and "seeing and believing". Under this programme each students are expected to work at rural level along with farmers or research station. This is the unique opportunity for the students to work with farmers at their farm and identify different production, protection and marketing impediments. RAWEP develops the competency in the areas of technological, managerial and communication skill among the students. The RAWEP provides the standard-based, down to earth and beneficial skill during the agriculture degree program. This methodology turns into a standard program among students' in India's agriculture universities. Close by, staff of the college endorsed this program as an indispensable a piece of their graduation period as far as offering this program. Here with, students' mentalities changed and get the chances to use information which is broadly acknowledged at the grassroots level. (Gredig and Bartelsen-Raemy, 2018) ^[10]. Further, in view of the study attempted to distinguish and gauges of students attitude and predict what impact on their life. Since long time, continuous changes in educational domain and encouraging technique may have helped students to bring up better execution in social studies. It's cleared that keeping unfavourable attitude towards social investigations could ultimately pushover subject and no compelling reason to focusing on it (Ose Mensah & Frimpong, 2020) ^[15]. Students' attitude towards RAWP to build the size of work on such activity that is correspondence ability, symptomatic aptitude. While, encouraging them towards this programme as an indispensable field in which attitude must be known (Akkus, 2019) ^[1].

Further, the knowing the attitude in domain of psychology generally defined that attitude comprise the situation of favourable or unfavourable manner concerning on particular object (Nonte, *et al.*, 2018) ^[16]. Moreover, attitude is the "internal state of readiness" that has three dimensions like affective, conative and cognitive.

The essential segment demonstrated passionate action of something else followed by a conative attitude which deals to behave in a particular way. Lastly, cognitive includes convictions of an individual's (Punla Hernandez, 2020) [11]. Ajzen, reported that attitude is hides thought of person's mind but it is measured by the feedback of an individual that may be favourable or unfavourable. Often attitude can be modified by which students can identify an intervention of the domain. (Byrne, *et al.*, 2018) [15].

Material and Method

A step-by-step procedure of Likert's summated ratings was followed to develop a standardized attitude scale. Likert's is a scale construction technique to develop a standardized attitude scale (Shitu, *et al.*, 2018) [19]. The present study was carried out during 2020-2021 by using a scientific methodology to develop an instrument for measuring the students' attitude regarding impact of RAWEP towards students. The scale was tested for its reliability and validity. The detail steps are being considered in methodology explained very well. The study emphasis on the development of scale which is based on the previous literature of reviews. The written items' found in self-explanatory mode which favourable to domain in order to assess the opinion. Considering the responses of respondents negative items was deleted from the draft (Akkus, 2019) [1]. Thus, investigation was done in the 3 collages of CCS Haryana Agricultural University, Hisar. However, Collage of Agriculture, Collage of Basic Science and Home Science were selected to make the sample sizes. From each selected collage 20 teachers were selected to check the reliability of interview schedule. Further, to make sure content adequacy and avoided fatigue 25 items were taken for précised answers of respondents. Meanwhile, scoring pattern was followed as Fully Agree = 3, Somewhat Agree = 2 and Not Agree = 1 for more susceptible and acquiescence. In the items 8 statements were deleted due to its ambiguity in the domain. For taking into account to get reliability significance value the Cronbach's alpha was applied. Herewith, value are i.e. 744 to.725 indicates good rehabilitee of the scale.

Scale Dimensionality

Under this step of scale encounters the amount of number and nature of items/statements by examining the several threats of scale. So that these variables are called latent and are measured by scale items. During the selection of variables researcher selected the variable (*e.g.*, attitude) as single variable. Hence, the scale is considered to be an one-dimensional because the scale tapping only one variable.

Reliability and Validity Tests

The validity refers to measures lateness of variable and occurred from the beginning to recognize the domain of the study; the instrument being administrated to focus on the samples. However, validation of the content and items was done after the survey. This method made it possible to assess the validity to adopt newly developed scale (Boateng, *et al.*, 2018) [3]. As investigation was conducted for batter judgment to analysing the items. Further, Corrected item-total score values of the item were analyzed need fully. It was found absolutely corrected where item-total correlation value found below the accepted value i.e. 20 (Jhonson and Morgan, 2016)

[12] Therefore, applied Cronbach's alpha value is.744 which indicated acceptable for the ultimate version of scale. The data presented in the Table1 the performance of respondents towards RAWEP 25 statements were selected for the analysis of scale. However, the one item was found irrelevant excluded from the questionnaire. After applying the Cronbach' alpha test secured the value 0.744 to 0.725 (Table 2) which indicated the excellent correlation between each items. The data presented in (Table 3), where 2.5 was the mean value of "item mean" followed by 0.32 was the value of "item Variances" indicated that item vary together in scale, remaining.09 and.03 was the value of "inter-item correlation" and "inter-item Covariance's" indicates that respondents raised the question on interview schedule were consistent and appropriate. According to the study the reliability test shows the results of alpha value is larger than 0.6 which is recommended that items are acceptable, and it will be considered as an instrument for the respondents. Subsequently, researchers can make improvisation of scale items to extend the value of alpha. Therefore, researchers proved it more reliable as an instrument among students domain (Ghavifekr and Rosdy, 2015) [9]. For the item analysis using criteria individual statements were screened for relevancies by the following formulae. Cronbach's alpha can be written as a function of the number of test items and the average inter-correlation among the item. Below for conceptual purposes we show the formula for the coronach alpha.

$$\alpha = \frac{N\bar{c}}{\bar{v}(N-1)\bar{c}}$$

Here,

\bar{N} = Number of items

\bar{c} = Average inter-item covariance among the items and

\bar{v} = Equals the average variance

It can be seen from this formula if the item number is increased than Cranach's alpha increased. Additionally, if average inter-item correlation is low alpha get low. As the average inter-item correlation increase, Cranach's alpha increase as well (Holding the number of items constant), (Buin, 2006).

Result

Table 1: Percentage distribution of respondents being excluded items n=24

Variable	Frequency	Percentage
Valid	20	100.0
Excluded ^a	00	000.0
Total	20	100.0

Note. List wise deletion based on all variables in the procedure

Table 2: Reliability significance of scale according Cranach's alpha value n=24

Variables	Scale Statistics
Cranach's Alpha	00.744
Standardized value	00.725
Mean	61.95
Variance	27.20
Std. Deviation	05.21

Note. Cronbach's alpha value.744 to.725

Table 3: Average distribution of respondents according to summary items statistic n=24

Statistic for scale	M	Min	Max	Range	Max/Min	Var
Item Means	02.5	2.1	2.9	0.75	1.3	0.07
Item Variances	0.32	.09	.64	0.54	6.7	0.04
Inter-Item Covariance's	0.03	-.22	.43	0.65	-1.9	0.09
Inter-Item Correlations	0.09	-.42	.74	01.1	-1.7	0.06

Table 4 indicated that two-column of interest is here "Corrected item-total Correlation" which described how much each item correlated in overall questionnaire score. When correlation is less than $r=.03$ indicated that item may not belong in the scale. In Table 4 only (Item 8) was found problematic considering this criterion. While, and more importantly, final column that is "Cronbach's Alpha if Item Deleted" as the name is suggested that column described Cronbach's alpha score. For instance, the current score is .744 when the score goes down we deleted an item. But if the score goes higher after the item is deleted, we might want to delete it as it would make our questionnaire more reliable. Therefore, deleted (Item 8) was responsible to increase the Cronbach's alpha score to .744, so deletion should be considered and all items should be in a questionnaire. As per

the study, thumb rule indicated: $\geq .9$ - Excellent; $\geq .8$ - Good; $\geq .7$ -Acceptable; $\geq .6$ -Questionable; $\geq .5$ -Poor; $< .5$ -Unacceptable. However, increasing the alpha value in some measures obsessed with the number of items. It is confirmed that the above sequence works like Low of Diminishing Return. Subsequently, an alpha value of .8 is probably is valid. This implies means the high value of Cronbach's alpha indicated the wonderful internal consistency of the items in the scale (George & Mallery, 2003) [8]. According to study reliability of the scale was determined by calculating the Cronbach's alpha for each construct considered or required in the study. Therefore, assessinh the magnitude of internal consistency. Cronbach's alpha comes to be .744 for the 25 statements of the questionnaire used in the study (Kaushal, 2020) [14].

Table 4: Analysis of final reliability test with help of SPSS n=24

Statements	Corrected Item-Total Correlation	Cranach's Alpha if Item Deleted
Helps to acquaint with farming community	.40	.73
Helps to understand with need based situations	.52	.72
RAWEP helps to get aware with rural institutions	.16	.74
Helps to understand the socio-economic conditions of the farmers	.40	.73
Helps to aware about the adoption patterns and gaps	.40	.72
RAWEP creates an attitude towards understanding farmer's women problems.	-.07	.75
Aware about farming system and Farming/home management.	.40	.73
Practical knowledge of different cropping patterns	.57	.71
Improve communication skills at field condition	.46	.72
Build leadership qualities to carry out the challenging task	.33	.73
Provides opportunities to work with various agriculture rural institutions	.30	.73
RAWEP provides opportunities to prepare farm plans and management	.63	.70
RAWEP provided opportunities to meet the progressive farmer's	.35	.73
Helps me to aware with current training programmes	.56	.71
Develop professional skill solve farmers field problems.	.43	.72
Opportunities to work with agro based industries to get more exposure	.30	.73
Increase harmonious relationship with farmers/host farmer	.28	.73
Get insight with farmers product	.00	.75
Helps me to develop a cosmopolite nature.	.25	.73
Focus on knowledge empowerment in unreached areas.	.04	.75
Helps to experience the teamwork culture	.20	.74
Knowledge about government implemented programmes in rural areas	.16	.74
Do you think RAWEP of CCSHAU is successful	-.27	.76
Help to get interact with extension worker/KVK scientists	-.31	.75

Note. Reliability test was done with help of SPSS Software

Discussion

The Table 1 indicates that opinion of the respondents the alpha coefficient in 25 items is 0.744, suggesting that the items have relatively high internal consistency. It was found that total valid items were 20 out of these no item found to be excluded. It is resulted that list wise delectation is based on all variable in procedure that means if there was a missing value for any of the item for a participant they were deleted completely so list wise meaning going to horizontally by raw if a participant had no one missing value that participant was omitted from the chronbox alpha. In the reliability statistic alpha value considered greater than 0.7 so 0.744 found pretty good. In Table 3 item statistics where mean and slandered deviation as well as the sample size for each items on our

scale found similar as calculated a frequencies or descriptive. In Table 4 item 1 is correlated with item 2 to 5 combined together item 2 correlated with item 1 combined with items. However, each item by itself correlated everything else in grouped together. In the last coloum of this Table 4 alpha if the item is deleted from the scale. So that output/value from the scale considered significantly alpha. It is confirmed that Cranach's alpha value is 0.744 is found suitable with reliability.

Conclusion

It could be concluded that students were ambivalent towards negative and positive notions. The study demonstrated the procedure for determining the reliability of the scale. After the

analysis of both validity and reliability test found capable to determine the instruments itself both valid and reliable for its intended purpose. As per study majority of the employees of the organization working in different dairies having favourable attitude pre-availing organization process (Singh, 2010) [18]. However, during investigation most of female teachers rather male were having positive attitude in case of increased retirement age of collage teachers (Bagdi and Shah, 2019) [2]. Considering proven facts scale is exceedingly reliable in the light of with overall Cronbach's alpha value. Hence, the team of the programme need to take resilient steps to make effective this programme so, the attitude of students might be more positive.

References

1. Akkuş A. Developing a Scale to Measure Students Attitudes toward Science International Journal of Assessment Tools in Education. 2019;6(4):706-720. doi: <https://dx.doi.org/10.21449/ijate.548516>.
2. Bagdi GL, Shah Anupama. Measurement of Attitude of Academicians towards Increased Retirement Age, Indian Journal of Extension Education. 2019;55(4):139-144.
3. Boateng GO, Neilands TB, Frongillo EA, Melgar-Quiñonez HR, Young SL. Best Practices for Developing and Validating Scales for Health, Social, and Behavioral Research: A Primer, Front. Public Health. 2018;6:149. doi: 10.3389/fpubh.2018.00149.
4. Bruin J. Newtest: Command to compute new test, ULCA: Statistical Consulting Group; c2006. p. 1. <https://stats.idre.ucla.edu/stata/ado/analysis/>
5. Byrne ZS, Weston JW, Cave K. Development of a Scale for Measuring Students 'Attitudes towards Learning Professional (i.e.,Soft) Skills. Research Science Education; c2018. <https://doi.org/10.1007/s11165-018-9738-3>.
6. Cabrera-Nguyen P. Author guidelines for reporting scale development and validation results in the Journal of the Society for Social Work and Research. Journal of the Society for Social Work and Research. 2010;1(2):99-103. doi:10.5243/jsswr.
7. Carpenter S. The Steps in Scale Development and Reporting: A Guide for Researchers. Communication Methods and Measures. 2018;12(1):25-44. doi: <https://doi.org/10.1080/19312458.2017.1396583>.
8. George D, Mallery P. SPSS for Windows step by step: A simple guide and reference. 11.0 update (4th Ed.). Boston: Allyn & Bacon; c2003.
9. Ghavifekr S, Rosdy WAW. Teaching and learning with technology: Effectiveness of ICT integration in School. International Journal of Research in Education and Science. 2015;1(2):175-191.
10. Gredig D, Bartelsen-Raemy A. Exploring social workstudents' attitudes toward research courses: predictors of interest in research-related courses among first year students enrolled in a bachelor's programme in Switzerland. Social Work Education. 2018;37(2):190-208. doi: <https://doi.org/10.1080/02615479.2017.1389880>.
11. Hernandez H. P Filipino Graduate Students' Attitudes Toward Teaching Educated Philippine English: A Sample From a Premier Teacher Education Institution. Asia-Pacific Social Science Review. 2020;20(1):31-42.
12. Johnson RL, Morgan GB. Survey scales: Investigating scale quality. New York, NY: The Guilford Press; c2016.
13. Karizos TA, Satlikas A. Applied Psychometrics: The Step of Scale Development and Standardization Process. Psychology. 2018;(9):2531-2560. doi:<http://www.scirp.org/journal/psych>.
14. Kaushal N, Ghalawat S, Malik JS, Singh A, Kumari N. Employees' Attitude towards Psychological Contract in Selected Industries. Indian Journal of Extension Education. 2020;56(4):54-60.
15. Mensah OR, Frimpong A. Factors Affecting Students' Attitude towards the Learning of Social Studies in the Accra Metropolis of Ghana: A Mixed Method Analysis. Journal of Educational and Psychological Research. 2020;2(1):31-42. doi: <https://www.researchgate.net/publication/340880782>.
16. Nonte S, Hartwich L, Willems AS. Promoting reading attitude of the girl and boys: a new challenge for educational policy? Multi- group analysis across four European Countries. Large-scale Assessment in Education. 2018;6(5):1-22. <https://doi.org/10.1186/s40536-018-0057-y>.
17. Roul R. Attitude of post-graduate students towards research. Research Guru: Online Journal of Multidisciplinary Subjects (Peer Reviewed). 2018;12(2):757-760.
18. Singh SRK, Chand R, Gautam US, Singh DK. A Scale to Measure Attitude of Dairy Personnel towards the Organizational Processes of COMPFED. Indian Journal of Extension Education. 2010;46(3 & 4):107-110.
19. Shitu Z, Hassan I, Aung MM, Kamaruzaman TH, Musa RM. Avoiding medication errors through effective communication in a healthcare environment. Malaysian Journal of Movement, Health & Exercise. 2018 Jan 1;7(1):115-28.