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Development of Scale to Examine the Entrepreneurial Behaviour among the Agriculture Students of Farm Universities in Karnataka

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Authors' contributions

This work was carried out in collaboration between all authors. Author SCV designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors KPR, SG and NRG managed the analyses, managed the literature searches of the study and made necessary corrections of the study. All authors read and approved the final manuscript.

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ABSTRACT

An effort is made in the present investigation to develop a scale to examine the entrepreneurial behaviour among the students who were in the final year of their basic degree in different farm universities of Karnataka state. The developed scale consists of 35 statements categorised under seven important dimensions. The total final year agriculture students in farm universities in Karnataka during 2019-20 were around 1200, but the scale was administrated to 50 final year students in the College of Agriculture, University of Agricultural Sciences, GKVK, Bangalore (UAS(B)) during 2019-20. The developed entrepreneurial behaviour scale was found to be highly reliable and valid. It was found that around two –fifth of students (38.00 %) were having medium entrepreneurial behaviour.

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Keywords: Entrepreneurial behaviour; students; farm universities; validity.

1. INTRODUCTION

Entrepreneurial behaviour is a "subset of entrepreneurial activities concerned with understanding, predicting and influencing individual behaviour in entrepreneurial settings" [1]. It is fact that all the trained graduates in all professional degree cannot be employed in public, private and corporate sector. Same situation applies to the graduates of farm universities in all around the country. So in the era of globalization, privatization and liberalization more and more students from farm universities should be encouraged to start an enterprise in the sectors like dairy, milk processing, poultry, fisheries, commercial horticulture, precision farming of flowers and vegetables, food processing, advisory services *etc,*. From this they become entrepreneurs, self-dependent and can also provide employment to the huge unemployed workforce. Thus, they can also contribute their part in Nation building. Hence there is a need to provide an entrepreneurial education to the students of farm universities at undergraduate level only. In this direction Indian council of agriculture research and farm universities of state were giving lot of importance to entrepreneurship through hands on training and also student ready programme. Inspite of all these efforts, hardly few students show interest to become entrepreneurs. Under these circumstances it was believed that if a detailed study is carried out on the entrepreneurial behaviour among students of farm universities, it would provide a feedback to suitably design the course curriculum and also provide guidelines to the ICAR, Central and State Government to design its youth policy, industrial policy etc. in such a way that more and more youth get attracted towards more lucrative entrepreneurial options. With this the present study is undertaken with the following specific objectives:

- To develop and standardize scale to measure the entrepreneurial behaviour of agriculture students.
- To examine the entrepreneurial behaviour among the agriculture students of farm universities.

The study was carried out by reviewing the related literature [2,3,4,5] to select the indicators to form scale for entrepreneurial behaviour.

2. METHODOLOGY

The present study was undertaken during 2019-20 for developing standardized scale to measure the entrepreneurial behaviour among agriculture students of farm universities in Karnataka. Standardization is the "process of putting different variables on the same scale. This process allows you to compare scores between different types of variables. Typically, to standardize variables, you calculate the mean and standard deviation for a variable. Then, for each observed value of the variable, you subtract the mean and divide by the standard deviation" [6]. The developed scale was used to analyze the entrepreneurial behaviour among agriculture students. Fifty students who were in 8th semester yet to complete the student ready programme were interviewed. Based on the cumulative score, the students were categorized as low, medium and high entrepreneurial behaviour category based on the mean and standard deviation as a measure of check. The process of development of scale is explained in step by step format in the following result and discussion sub heading.

3. RESULTS AND DISCUSSION

3.1 Development of Scale to Measure the Entrepreneurial Behaviour among Agriculture Students

Entrepreneurial behaviour among agriculture students is operationally defined for the sake of measurement by the researcher himself as "combination of various socio psychological, cognitive and affective domains like innovativeness, risk taking ability, achievement motivation, decision making ability, leadership ability, management orientation and goal setting ability which inturn ultimately determines agricultural students to accept entrepreneurship as their carrier option." Since entrepreneurship itself is an innovative dimension promotes in various degree programme and there was no scale to measure the entrepreneurial behaviour among agriculture students, hence an attempt was made to develop a scale to measure the entrepreneurial behaviour among agriculture students. Which will helps to locate prospectus entrepreneurs in farm universities, since there is lot of scope to venture in farm sector in the days

to come. The method of summated rating scale suggested by Likert [7] and Edwards [8] were followed in the development of the scale following seven stages *viz.,* identification of components, collection of item/statements, editing of the items, relevancy test, item analysis, reliability and validity [9].

3.1.1 Identification of components

since entrepreneurship is a comprehensive domine involving different dimensions to promote concrete meaning. Seven components related to entrepreneurial behaviour were identified based on review of literature and discussion with experts. The identified seven components are: (1) Innovativeness, (2) risk taking ability, (3) achievement motivation, (4) decision making ability, (5) leadership ability, (6) management orientation and (7) goal setting ability.

3.1.2 Collection of items/ statements

As per the procedure the first step in the construction of entrepreneurial behaviour scale was to collect statements pertaining to the entrepreneurial behaviour of agricultural students of farm universities. Since entrepreneurship is a border concept tentative lists of 92 statements pertaining to the entrepreneurial behaviour of agricultural students of farm universities were collected through extensive review of literature and by consulting Experts and Scientists.

3.1.3 Editing of the items

After exhaustive review and deliberations, these 92 statements were edited as per the 14 criteria enunciated by Edwards and Thurstone [10]. As a consequence, 22 statements were eliminated. The remaining 70 entrepreneurial behaviour statements were considered for further statistical process.

3.1.4 Relevancy test

Seventy statements were sent to 90 experts in the field of social sciences working in State Agricultural Universities, Indian Council of Agricultural Research Institutes and Development departments and few successful entrepreneurs to critically evaluate the relevancy of each statement viz. Most Relevant (MR), Relevant (R), Somewhat Relevant (SWR), Less Relevant (LR) and Not Relevant (NR) with the score of 5,4,3,2 and 1, respectively. The judges were also requested to make necessary modifications along with additions or deletion of statements, if they desired to. A total of 61 judges returned the questionnaires duly completed and these were considered for further analysis. From the data gathered, 'relevancy percentage' and mean relevancy score' were worked out for all the 70 statements. Using these criteria, individual statements were screened for relevancies using the following formulae:

a) $$\text{R.P.} = \frac{\text{MR}\times5 + \text{R}\times4 + \text{SWR}\times3 + \text{LR}\times2 + \text{NR}\times1}{\text{Maximum possible score}} \times 100$$

b) $$\text{M.R.S.} = \frac{\text{MR}\times5 + \text{R}\times4 + \text{SWR}\times3 + \text{LR}\times2 + \text{NR}\times1}{\text{No. of judges responded}}$$

Accordingly, statements having 'relevancy percentage' of 80 per cent and above and mean relevancy score of 4.00 and above were considered for final selection. Accordingly, 46 entrepreneurial behaviour statements were retained after relevancy test and these statements were suitably modified and written as per the comments of the judges wherever applicable.

3.1.5 Item analysis

After relevancy test the forty six statements were subjected to item analysis to delineate the items based on the extent to which they can differentiate the respondent having higher entrepreneurial behaviour from the respondent with lower entrepreneurial behaviour. In order to conduct pre-test exercise, a sample of 32 horticulture students of University of Horticultural Sciences Bagalkot-Regional Campus Bengaluru were chosen for the study. The respondents were asked to indicate their degree of agreement or disagreement with each statement on a five-point continuum ranging from 'strongly agree' to 'strongly disagree'.

Based upon the total scores, the respondents were arranged in descending order. The top 25 per cent of the respondents with their total scores were considered as the high group and the bottom 25 per cent as the low group. These two groups provided criterion groups in terms of evaluating the individual statements. Thus, out of 32 students to whom the items were

administered for item analysis, eight students with highest and eight students with lowest scores were used as criterion groups to evaluate individual items. The critical ratio, that is, the 't' value which analyses the extent to which a given statement differentiates between the higher and lower groups of respondents for each statement, was calculated by using the following formula:

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

Where,

$\bar{X}_H$= The mean score on given statement of the high group
$\bar{X}_L$ = The mean score on given statement of the low group
$\sum X^2_H$= Sum of squares of the individual score on a given statement for high group
$\sum X^2_L$ = Sum of squares of the individual score on a given statement for low group
n = Number of respondents in each group
$\sum$ = Summation
t = The extent to which a given statement differentiates between the high and low groups.

After computing the't' value for all the 46 items, Thirty five statements with 't' value equal to or greater than 1.87 were finally selected and included in the final entrepreneurial behaviour scale. Based on the values obtained for all statements the critical ratio was selected viz., it depends on the researcher choice to fix critical ratio to further go for higher precision of the developed scale. So the 1.87 is not the standardized one for all scale.

3.1.6 Reliability of the scale developed

Reliability in its true sense refers to precision of the scale constructed for any purpose. The split-half method was employed to test the reliability of the entrepreneurial behaviour scale. The value of correlation coefficient was 0.724 and this was further corrected by using Spearman Brown formula to obtain the reliability coefficient of the whole set. The 'r' value of the scale was 0.839, which was significant at one per cent level indicating the high reliability of the scale. It was concluded that the entrepreneurial behaviour scale constructed was reliable.

a) Half test reliability formula

$$r_{1/2} = \frac{N(\sum XY) - (\sum X)(\sum Y)}{\sqrt{(N\sum X^2 - (\sum x)^2)\ (N\sum Y^2 - (\sum y)^2)}}$$

Where,

ΣX = Sum of the scores of the odd number items
ΣY = Sum of the scores of the even number items
ΣX^2= Sum of the squares of the odd number items
ΣY^2 = Sum of the squares of the even number items

b) Whole test reliability formula

$$r_{11} = \frac{2.r_{1/2}}{1+r_{1/2}}$$

Where,

$r_{1/2}$= Half test reliability

3.1.7 Validity of the scale

The data was subjected to statistical validity, which was found to be 0.916 for scale which is greater than the standard requirement of 0.70. Hence, the validity coefficient was also found to be appropriate and suitable for the tool developed. Thus, the developed scale to analyze Entrepreneurial behaviour among agriculture students of farm universities was feasible and appropriate.

3.1.8 Administration of the scale

The final scale consists of 35 statements (Table 1) for determining the Entrepreneurial behaviour among agriculture students. The response were collected on a five-point continuum, namely, strongly agree, agree, undecided, disagree and strongly disagree with assigned score of 5,4,3,2 and 1 for positive statements and reverse scoring for negative statements respectively. The entrepreneurial behaviour score of respondents was calculated by adding up the scores obtained by all statements. The entrepreneurial behaviour score of this scale ranges from a minimum of 35 to a maximum of 175. Based on the mean (128.10) and the half standard deviation (6.74), the students were categorized into three entrepreneurial behaviour categories *viz.,* low, medium and high. Higher score on this scale indicates that the respondents had high entrepreneurial behaviour.

Table 1. Scale to measure the entrepreneurial behaviour among the agriculture students of farm universities

Sl. No	Statements	SA	A	UD	DA	SDA
	A. Innovativeness					
1.	My family and peer groups discourages my innovativeness	1	2	3	4	5
2.	Agriculture innovations are simple, possess high value and adoptable	5	4	3	2	1
3.	I will not try to explore Startup opportunities for taking up new ventures	1	2	3	4	5
4.	Innovations in Agri-startups derives more opportunities	5	4	3	2	1
5.	I learnt innovative way of doing things during Hands on Training (HOT)	5	4	3	2	1
	B. Risk Taking Ability					
6.	A person should undertake risk to make a big profit than to be content with less profit	5	4	3	2	1
7.	Person who is not willing to take greater risks usually have a better financial conditions	1	2	3	4	5
8.	Trying an entirely new enterprise by a person involves risk, but it rewards higher	5	4	3	2	1
9.	I learnt that moderate risk taking fetches good results	5	4	3	2	1
10.	I am willing to take up innovations which even prone to on natural uncertainties	5	4	3	2	1
	C. Achievement Motivation					
11.	I Work differently to achieve more	5	4	3	2	1
12.	I would not like to accept new challenges because that makes me to work harder	1	2	3	4	5
13.	I want to earn only to attain a comfortable way of life	1	2	3	4	5
14.	I could get satisfaction of serving farmers than mere earning profit	5	4	3	2	1
15.	The satisfaction derived in RAWE programme motivated me to achieve more in future	5	4	3	2	1
	D. Decision Making Ability					
16.	I Always depend on elders, teachers, mentors, friends and relatives to take decision on important activities	1	2	3	4	5
17.	I will consider seasonality future factors before decision making in Agri-preneurship	5	4	3	2	1
18.	One should not take timely decision to achieve in life	1	2	3	4	5
19.	It is necessary for a person to look after all the choices before making final decisions	5	4	3	2	1
20.	I normally decide based on Prevailing conditions and also anticipated future	5	4	3	2	1
	E. Leadership ability					
21.	I will be leader than follower	5	4	3	2	1
22.	I am happy to solve problems before somebody tries to solve it	5	4	3	2	1
23.	I will not motivate others to get desired results	1	2	3	4	5
24.	I will lead the team of like-minded professionals to take up enterprise	5	4	3	2	1
25.	I proved my leadership qualities in RAWE programme	5	4	3	2	1
	F. Management orientation					
26.	I find very easy to manage things as I am good at	5	4	3	2	1

Sl. No	Statements	SA	A	UD	DA	SDA
	communication skills					
27.	I have not learnt the operational skills duly rather than mere doing things	1	2	3	4	5
28.	I always set priorities and organize to achieve my goals	5	4	3	2	1
29.	I will not make use of incubation facilities available to initiate an enterprise	1	2	3	4	5
30.	I learnt managerial skills in industrial and KVK attachment courses	5	4	3	2	1
	G. Goal Setting ability					
31.	I always set standards to achieve more in a life	5	4	3	2	1
32.	Setting goals will always help to boast the confidence of an individual	5	4	3	2	1
33.	Setting goals is not an important aspect in start-up ventures	1	2	3	4	5
34.	I will not set short and long term goals based on nature of enterprises	1	2	3	4	5
35.	I would try to set my goals before completing graduation	5	4	3	2	1

SA-Strongly Agree, A-Agree, UD-Undecided, D-Disagree, SD-Strongly Disagree

Table 2. Entrepreneurial behaviour among agriculture students of college of agriculture, university of agricultural sciences, Bangalore

(n=50)

Sl. No.	Category	Agriculture students	
		Frequency	%
1.	Low (<121.36 score)	16	32.00
2.	Medium (121.36-134.84 score)	19	38.00
3.	High (>134.84 score)	15	30.00

3.2 Entrepreneurial Behaviour among the Agriculture Students of University of Agricultural Sciences, Bangalore

The entrepreneurial behaviour scale developed was administered to 50 final year agriculture students of college of agriculture, university of agricultural sciences, GKVK, Bangalore in Karnataka state during 2019-20. The findings revealed (Table 2) that around two-fifth of the students (38.00 %) had medium entrepreneurial behaviour category followed by 32.00 per cent and 30.00 per cent of the students had low and high entrepreneurial behaviour respectively. From the above results it can be concluded that more than one-third (68.00 %) of the respondents in Bengaluru had belong to the medium to high level of entrepreneurial behaviour category. The reason for this was normally Bengaluru is the metropolitan city, students were more exposed to the business opportunities, the students get ample number of opportunity to exhibit their talents in different conferences, exhibitions etc., students had more cosmopoliteness nature and also had well experienced faculty to support their innovative ideas. Hence the results were obtained between medium to high entrepreneurial category. The results were on par with the Ghambi [4] and Dilipkumar [5].

4. CONCLUSION

The entrepreneurial behaviour scale developed is found to be reliable and valid; hence it can be used to analyze the entrepreneurial behaviour among the students. The results of the study revealed that 68.00 per cent of the students had medium to high level of entrepreneurial behaviour. It can be concluded that scale developed could be useful in explicitly measuring the entrepreneurial behaviour among agriculture students of farm universities.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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