International Journal of Current Advanced Research
ISSN: O: 2319-6475, ISSN: P: 2319-6505, Impact Factor: SJIF: 5.995
Available Online at www.journalijcar.org
Volume 6; Issue 12; December 2017; Page No. 7958-7962
DOI: http://dx.doi.org/10.24327/ijcar.2017.7962.1261

Research Article

A CRITICAL STUDY TO DETERMINE HIGH IMPACT OF TEACHING METHODS FOR ENTREPRENEURSHIP DEVELOPMENT ALLIED MANAGEMENT EDUCATION

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A R T I C L E I N F O

Article History:
Received 15th September, 2017
Received in revised form 25th October, 2017
Accepted 23rd November, 2017
Published online 28th December, 2017

Key words:
Entrepreneurship, Economy, Education

A B S T R A C T

The vast literature shows that entrepreneurship is a key driver of any economy; where wealth and a high majority of jobs are created by small businesses started by entrepreneurially minded individuals, many of whom go on to create large businesses. Assuming extraordinary relevance of entrepreneurship a number of technology institutions and management schools have incorporated entrepreneurship development in their curriculum; however, the teaching methods used in these institutions have not been evaluated extensively. This research paper is an attempt to evaluate the efficiency of these teaching methods incorporated by entrepreneurial development fostering management institutes.

INTRODUCTION

Though there are different schools of thought, where one school is of the view that it is in the genes and another school believes that entrepreneurs can be made. Entrepreneurship plays such a vital role in the economic development of countries all over the world (Carree and Thurik, 2000). Educating people who can start, innovate, build or buy businesses is crucial to the economic development of the world (Nalla and Sanapala, 2015). It is essential that schools continue to invest heavily in entrepreneurship to enhance their region's economic viability (Finkle 2012). Moreover, there seems to be widespread recognition that entrepreneurship is the engine driving the economy and society of most nations (Brock and Evans, 1989; Acs, 1992; Carree and Thurik, 2002). Also, recognizing the economic benefits of entrepreneurship, governments in different countries have started to look towards the management education as a possible avenue for reaching the goals of employment (Gangaiah and Viswanath, 2014).

Entrepreneurship Education

There has to be a way to resolve the issues which have held the Indian economy at factor-driven stage. Indian economy needs to find certain key pillars on basis of which it can generate the opportunities to grow. As India is at 3rd rank for the market size, 21st at financial market development, 40th for business sophistication and 41st for innovation, there is a need to channelize such pillar for the economy transition.

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In India there are many universities from which a number of graduates pass out every year in all streams of education. Moreover, in view of the economic development of India, it is necessary that a more focused approach for management education be taken so that robust yield of entrepreneurs can be developed though this education system (management education). Thus, in view of the vast market and the opportunities arriving to the entrepreneurs it is essential that quality higher education and training for the aspiring entrepreneurs is readily available (Jones and English, 2004). Today, a number of technology institutions and management schools have incorporated entrepreneurship development in their curriculum; however, the teaching methods used in these institutions have not been evaluated extensively.

RESEARCH METHODOLOGY

Study Area

The study was delimited to eleven districts of Vidarbha namely Nagpur, Wardha, Chandrapur, Gadchiroli, Bhandara, Gondia, Amravati, Yawatmal, Washim, Akola and Buldana.

Design of Study and Sample Selection

The design of the study was random group design, where the entrepreneurs from Vidarbha region were selected randomly. In this study, data was collected from 400 entrepreneurs.

Primary data collection

In this study, all the data generation was done by using standard procedures. Data collection was carried out by using a structured questionnaire (research instrument) and by following survey method.

Questionnaire development and Reliability estimation

The reliability of the questionnaire was assessed prior to its use for data collection. For this a pilot test was conducted and all the standard procedures were employed to check the reliability (test–retest method) and validity of the questionnaire.

Statistical Analysis of Data

Statistical analysis of data was done with the help of Statistical Package for Social Sciences (SPSS) 18.0 software. The inferential statistics such as factor analysis was used to find out the most effective teaching method vis-à-vis entrepreneurship development. The significance level will be chosen to be 0.05 (or equivalently, 5%).

RESULTS AND DISCUSSION

In order to find out the most effective teaching methods as far as entrepreneurship development is concerned, the data was analysed using factor analysis technique, and the results of the same is presented hereunder.

Factor Analysis

Factor analysis is a mathematical procedure used to reduce a large amount of data into a structure that can be more easily studied. Factor analysis summarizes information contained in a large number of variables and condenses it into a smaller number of factors containing variables that are interrelated. The results of factor analysis are used to describe variability among observed variables in terms of fewer unobserved variables that are known as factors. The observed variables are modeled as linear combinations of the factors, plus "error" terms. The information gained about the interdependencies was used later to reduce the set of variables in a dataset. Factor analysis was carried out to represent a set of observed variables $X1$, $X2$ …. Xn in terms of, a number of 'common' factors plus a factor that is unique to each variable.

The common factors (latent variables) are hypothetical variables which explain why a number of variables are correlated with each other, since they have one or more factors in common (Costello and Osborne, 2005). Factor analysis was performed (for independent variables as well as dependent variables separately) to understand the degree/multitude of total variation in the recorded data. The results of the factor analysis are presented hereunder.

Multicollinearity

The factor analysis technique was employed to summarize different variable's scores with a small number of factors without losing too much information. Before analyzing the data for factor analysis, multicollinearity was checked by determining the correlation coefficients (r^2). All the correlation coefficients (r^2) were observed to be less than 0.900, which confirmed the suitability of data for factor analysis.

Kaiser-Meyer-Olkin (KMO) and Bartlett's Test

The sample sufficiency for Factor analysis was determined by calculating the KMO statistic. In the present investigation, the KMO statistics was found to be 0.815, which indicated a sufficient number of samples for Factor analysis (Kim and Mueller, 1978). Furthermore, for this data the Bartlett's test is highly significant ($P<0.001$), and therefore indicated a suitability of data processing employing factor analysis procedure (Bartlett, 1950) (Table 1).

Table 1 KMO and Bartlett's test results

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.815
Bartlett's Test of Sphericity	Approx. Chi-Square	4153.115
	Df	630
	Sig.	.000

Communalities

Proportion of a variable's variance explained by a factor was calculated by determining the communalities. With the present data sets, the extraction communalities were found to be fairly high, indicating that the variables fit well with the factor solution. The results of the communalities statistics are presented in Table 2.

Table 2 Communalities for Input Variables

Teaching Methods	Initial	Extraction
Traditional lecture	1.000	.727
Textbook assignment	1.000	.687
Questioning	1.000	.761
Question-and-answer	1.000	.715
Excursion/industrial visits	1.000	.713
Discussion	1.000	.752
Discovery	1.000	.771
Demonstration	1.000	.690
Apprenticeship	1.000	.699
Role playing	1.000	.674
Case Report	1.000	.605
Team Teaching	1.000	.647
Guest Speaker	1.000	.769
Seminar	1.000	.682
Brainstorming	1.000	.776
Interview	1.000	.552
Cooperative Plan	1.000	.526
Leaderless	1.000	.683
Devil Advocate	1.000	.646
Conference	1.000	.625
Debate	1.000	.636
Project	1.000	.686
Large Group	1.000	.599
Small Group	1.000	.694
Experimental	1.000	.654
Heuristic	1.000	.602
Participatory	1.000	.506
Stimulated Office Plan	1.000	.601
Institutional	1.000	.698
The Case Study	1.000	.584
The Planning	1.000	.636
The Generic	1.000	.718
Case analysis and Simulations	1.000	.624
Team building	1.000	.589
Generating innovations	1.000	.657
Learning by doing	1.000	.575
Extraction Method: Principal Component Analysis.		

Eigenvalues

The eigenvalues equal the sum of the column of squared loadings for each factor. They measure the amount of variation accounted for by a pattern. Dividing the eigenvalues either by the number of variables or by the sum of h^2 values and multiplying by 100 determines the percent of either total or common variance, respectively. **Table 3** lists the eigenvalues associated with each linear component (factor) before and after extraction. Before extraction SPSS has identified a total of 36 linear components (as the total numbers of independent variables are 36). The eigenvalues associated with each factor explains the variance explained by that particular linear component. The first three components explain more than 43% of the total variance. Since factor analysis is mainly used for data reduction, the factors that explain more than 40% of variance (i.e. first three factors) were selected.

The total number of factors for extraction was based on Kaiser (1960, 1970) eigenvalue rule and Cattell (1966) scree test. He suggested a rule for selecting a number of factors m less than the number needed for perfect reconstruction: set *m* equal to the number of eigenvalues greater than 1. Several lines of thought lead to Kaiser's rule, but the simplest is that since an eigenvalue is the amount of variance explained by one more factor, it doesn't make sense to add a factor that explains less variance than is contained in one variable. Moreover, the scree test is based on a subjective examination of the plot of eigenvalues for each successive factor, looking for an "elbow" in the plot. Cattell guidelines call for retaining those factors above the "elbow" and rejecting those below it. Hence, in the present study, based on Kaiser (1960, 1970) eigenvalue rule and Cattell (1966) scree test, a limited number of factors i.e. three were selected for extraction.

Scree Plot

A graphical method is the *scree* test first proposed by Cattell (1966). Cattell suggests to find the place where the smooth decrease of eigenvalues appears to level off to the right of the plot. To the right of this point, presumably, we find only "factorial scree" - "scree" is the geological term referring to the debris which collects on the lower part of a rocky slope.

According to this criterion, we would probably retain as less factors as possible. Furthermore, based on the factors explained by the Kaiser criterion (Scree Plot), total three factors were confirmed. The scree plot (**Figure 1**) showed the presence of factors arranged in a descending order. The factors were assigned a number in a decreasing order based on their contribution to total variance.

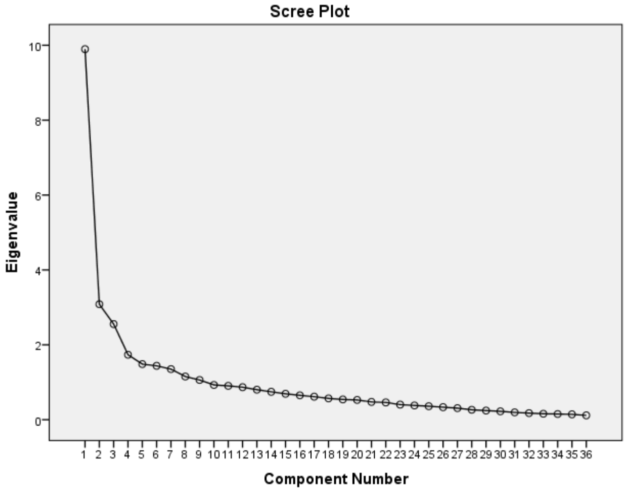

Fig 1 Scree Plot

Component Matrix

The "Component Matrix," rotated (Tables 4), indicates the factor loadings. The factor loadings, also called component loadings in principal component analysis, are the correlation

Table 3 Total variance explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	9.896	27.489	27.489	9.896	27.489	27.489
2	3.084	8.567	36.056	3.084	8.567	36.056
3	2.553	7.092	43.148	2.553	7.092	43.148
4	1.736	4.822	47.969	1.736	4.822	47.969
5	1.484	4.122	52.092	1.484	4.122	52.092
6	1.439	3.996	56.088	1.439	3.996	56.088
7	1.351	3.753	59.841	1.351	3.753	59.841
8	1.153	3.202	63.043	1.153	3.202	63.043
9	1.061	2.946	65.989	1.061	2.946	65.989
10	.928	2.579	68.568			
11	.903	2.510	71.078			
12	.869	2.413	73.491			
13	.801	2.224	75.715			
14	.746	2.071	77.786			
15	.691	1.920	79.706			
16	.651	1.809	81.515			
17	.615	1.709	83.224			
18	.570	1.582	84.806			
19	.541	1.502	86.308			
20	.528	1.466	87.774			
21	.475	1.319	89.093			
22	.461	1.282	90.374			
23	.404	1.121	91.495			
24	.380	1.056	92.551			
25	.360	1.001	93.553			
26	.335	.930	94.483			
27	.309	.858	95.341			
28	.266	.738	96.078			
29	.244	.679	96.757			
30	.223	.621	97.378			
31	.195	.543	97.920			
32	.177	.490	98.411			
33	.160	.444	98.855			
34	.152	.422	99.277			
35	.144	.399	99.676			
36	.117	.324	100.000			

coefficients between the variables (rows) and factors (columns). Factor loadings are the basis for attributing a label to the different factors. In general the loadings above .6 are considered "high" and those below .4 are "low" (Hair, 1998). by the management institutions. The description of factors is as follows.

Table 4 Component matrix (rotated) for all the variables

	Component								
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Apprenticeship	.750								
Large Group	.651								
Experimental	.624								
Discovery	.605								
Role playing	.552								
Demonstration	.458								
Participatory	.427								
The Planning		.749							
The Case Study		.679							
Team building		.626							
Learning by doing		.622							
Generating innovations		.529							
Case analysis & Simulations		.528							
Leaderless			.752						
Project			.661						
Cooperative Plan			.533						
Debate			.496						
Guest Speaker				.761					
Conference				.712					
Seminar				.609					
Interview				.506					
Traditional lecture					.782				
Textbook assignment					.762				
Institutional					.732				
Questioning					.493	.463			
Question-and-answer						.726			
Excursion/industrial visits						.690			
Discussion						.676			
The Generic							.757		
Heuristic							.551		
Devil Advocate							.497		
Brainstorming								.819	
Case Report								.473	
Small Group									.702
Team Teaching									.459
Stimulated Office Plan									.434

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 11 iterations.

Factor Naming

Factor rotation (which is the step in factor analysis) allows identifying meaningful factor names or descriptions. We can then name the factors subjectively, based on an inspection of their loadings. In the present study *oblique* rotation was used as it often achieves greater simple structure. Furthermore, extracted factors were assigned names. Factors naming factors is a theoretical and inductive step, where the procedure usually considers three or four items with the highest loading on a particular factor, are selected and studied in relation to the prevailing concepts in the domain (impact of teaching methods in this study) under investigation i.e. entrepreneurship development curriculum and teaching. Hence, a common theme representation by different elements (items) was assessed for all the factors to get deeper insight about each factor. In naming the factor (Table 5), care was taken so as to have a simpler name for the factor, which was suggestive as to what dimension that factor represented. The factor analysis revealed that the 'scientific participatory teaching', 'pragmatic and systematic teaching' and 'cooperative project based learning' are the three important factors that make highest impact in the entrepreneurship development programs offered

Table 5 Description of factors

Factors	Factor's Name	Loading Variables
Factor 1	Scientific participatory teaching	• Apprenticeship • Large Group • Experimental • Discovery • Role playing • Demonstration • Participatory
Factor 2	Pragmatic and systematic teaching	• The Planning • The Case Study • Team building • Learning by doing • Generating innovations • Case analysis and Simulations
Factor 3	Cooperative project based learning	• Leaderless • Project • Cooperative Plan • Debate

CONCLUSIONS

The vast literature shows that entrepreneurship is a key driver of any economy; where wealth and a high majority of jobs are created by small businesses started by entrepreneurially minded individuals, many of whom go on to create large businesses. Moreover, people exposed to entrepreneurship frequently express that they have more opportunity to exercise creative freedoms and high self esteem. It is with this in mind that the Entrepreneurship Education offers a great avenue where the people creativity can be properly channelized and the resultant human resource can become a successful entrepreneur. Hence, to achieve this prime requisite is the high effectiveness of teaching methods. Hence, based on the study results it is evident that the most effective of impactful teaching methods are Scientific participatory teaching (which highlights the role of teaching methods like that involve, Apprenticeship, Large Group, Experimental, Discovery, Role playing, Demonstration and Participatory teaching methods), followed by Pragmatic and systematic teaching (which focuses on the Planning, Case Study, team building, learning by doing, generating innovations and case analysis and simulations) and lastly Cooperative project based learning (which revealed leaderless approach, project based learning, cooperative plan and debate to be integral part of entrepreneurship related teaching).

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How to cite this article:

Aniruddha Akarte and Ujwal Lanjewar (2017) ' A Critical Study to Determine High Impact of Teaching Methods For Entrepreneurship Development Allied Management Education ', *International Journal of Current Advanced Research,* 06(12), pp. 7958-7962. DOI: http://dx.doi.org/10.24327/ijcar.2017.7962.1261

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