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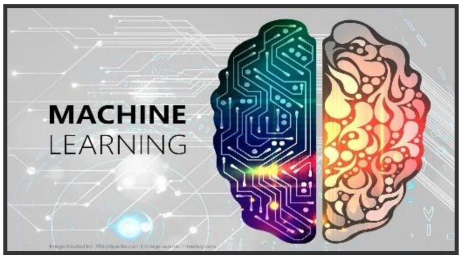

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Prediction of NAAC Grades for Affiliated Institute with the help of Statistical MultiCriteria Decision Analysis

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ABSTRACT: National Assessment and Accreditation Council is an impartial group of the University Grants Commission (UGC) of India, mounted in 1994. It has taken the duty of assessing and accrediting faculties and universities in India to encourage the instructional surroundings for the development of excellence in teaching, learning, and discovery in superior training. In those missions, NAAC acts a dynamic role. NAAC has been worried about reforming its ongoing Valuation and Certification policies, grounded on its arena, its shared statistics with different International Quality Assurance Agencies, and the best necessities within side the worlds converting the state of affairs over the progressive training development. In this paper, a new mathematical model is developed to explore the NAAC rating of a well-known Engineering College, considering nine more well-known Engineering Colleges. The system is characterized by NAAC Accreditation Criteria using Multi-Criteria Decision Making Methods, Statistics, and Group Decision Making.

INDEX TERMS: WSM, ENTROPY, TOPSIS, VIKOR, ANOVA, Spearman's Rank Correlation Coefficient, Group Decision Making, Additive Ranking, Multiplicative Ranking, Least Square Additive Regression method

I. INTRODUCTION

In the present centuries, several colleges and universities have been built. Still, the prevalence and difficulty amongst them have now no longer been stepped forward proportionally. This has been an unembellished difficulty for the state and the universities. The directors of the instructional establishments have to awareness greater at the enhancement of worldwide eminence of training like

- Proprietor Status
- Teacher/Student Proportion
- Teacher Credentials
- Worldwide Faculty Ratio
- Worldwide Student Ratio etc.

through constant upgrading agendas. They have to recognize its sturdy points, faintness, and possibilities via a knowledgeable assessment process. They should identify the internal areas of planning and resource allocation, teamwork on the campus. Also, the funding agencies look for objective data for performance funding.

NAAC accreditation helps higher learning associations to recognize their assets, prospects, and weaknesses through a well-versed assessment procedure. NAAC approval will also support funding agencies with impartial data to decide on the funding of higher learning establishments. The National Accreditation and Assessment Council (NAAC, 2008) show that only 30 percent of universities and 10 percent of the colleges are with 'A' grade or "Five-star" institutions. The rest are tolerable or poor. Maintaining and improving advanced education quality are the tremendous challenges in India (Muzammil.M,2010). Performance-linked development systems with validity and reliability will be crucial for excellence declaration and quality sustainability in engineering colleges. The seven criteria recognized by NAAC, assist as the origin for assessment of Higher Education Institutions (HEIs) are:

Program of studies.

Education-training and Assessment.

Revolutions, Investigation, and Extension.

Association and enlightenment.

Beginner Facility and Development.

Authority, Guidance, and Supervision.

Revolutions & Policies.

In our proposed paper, we have sketched a methodical model to evaluate the NAAC score of an Engineering College concerning two criteria (recognized by NAAC) Criteria-2 Teaching-Learning and Evaluation and Criteria-3 Research, Consultancy Extension. These paper intentions to offer a hypothetical methodology in multi-criteria decision-making problems with Statistics and a practical application of improvement of the overall excellence of the education system. The proposed approach integrates Weighted Sum Method (WSM), ENTROPY, and Technique for Order Preference by Similarity to the Ideal Solution (TOPSIS), VIKOR, ANOVA, Spearman's Rank Correlation Coefficient, Group Decision Making, Additive Ranking, Multiplicative Ranking, Additive Least Square Regression method, and Multiplicative Least Square Regression method.

II. LITERATURE REVIEW

The multi-criteria decision-making method is a general manner substantially implemented for outlining the best rationalization amongst several options having more than one attributes or option. Pin-Chang Chen tries in [1] to categorize appropriate man or woman tendencies and seriously qualified assistances through facts statistics. P. Kousalya and et al. presented the usage of multi-standards decision-making strategies for status options to manipulate pupil absenteeism in engineering colleges [2]. Hwang first developed a method for Order Preference by Similarity to the Ideal Solution (TOPSIS), and Yoon [3] is constructed at the concept that the chosen opportunity ought to have the shortest distance from the positive ideal solution and, on the other side, the farthest attain of the perfect negative solution. The alternate resolution is taken into consideration as the ultimate answer within side the VIKOR approach [Opricovic, S. and Tzeng, G.-H., 2007]. The Entropy Method approximates the weights of the numerous standards from the given payoff matrix and is self-figuring out of the decision-maker's views. Hwang and Yoon (1981) mentioned that the Entropy Method facilitates discovery variations among units of data. Hwang and Yoon (1981) mentioned that the Entropy Method helps explore differences between sets of data. Weighted Sum Method is a software kind MCDM approach.

The one-way analysis of variance (ANOVA) test is a manner to decide whether or not there are any statistically huge variations between the way of 3 or greater independent (unrelated) methods. NOVA parametric tests, with a couple of comparisons. Garcia et al. [4] proposed a mixed parametric/nonparametric process for evaluating evolutionary algorithms' convergence in a solitary criterion framework. The observed data are tested by the parametric ANOVA test.

Spearman rank correlation coefficient helps to decide the degree of association/correlation (including positive or negative direction of a relationship) amongst ranks attained via way of means of extraordinary MCDM strategies and extraordinary decision-makers and extraordinary situations for a given set of alternatives. Additive Ranking, Multiplicative Ranking are extensively utilized to decide the degree of association/correlation amongst strategies.

Finally, the Least Square Additive Regression method and Least Square Regression Multiplicative method are used to calculate the NAAC score.

III. PROPOSED METHODOLOGY

The experiment is constructed on Criteria 2 and Criteria 3 (recognized by NAAC), considering ten renowned Engineering Colleges. A preliminary literature survey is carried out to choose the criteria, and sub-criteria from NAAC Assessment System. 10 Engineering Colleges were examined and randomly nominated for the present study. Now names of 10 Colleges, Criteria 2 and Criteria 3 (recognized by NAAC) are described below:

Names of Colleges

Col-1:Dr. B.C. Roy Engineering College

Col-2:Alphonsa College

Col-3:KCG College

Col-4:Kavikulguru Institute of Technology and Science

Col-5:Sanghvi College of Engineering

Col-6:Walchand Institute of Technology

Col-7:Swami Ramanand Teerth Mahavidyalaya

Col-8:Dravidian University

Col-9:Guru Nanak Institute of Technology

Col-10:Netaji Subhash Engineering College

Criteria 2 - Education-training and Assessment

C-1	Student registration percentage (average of last five years)

C-2	Percentage of seats for reserved categories (last five years)
C-3	Organizing special Programmes for modern novices and gradual novices
C-4	Student teacher ratio (Full time)
C-5	Problem-solving methodologies to enhance studying experiences
C-6	Using ICT for powerful coaching-studying process
C-7	Mentor student ratio
C-8	Full time teachers (average percentage)
C-9	Full time teachers with Ph.D./ D.M./M.Ch./D.N.B Super speciality/ D.Sc /D.Litt (average percentage)
C-10	Teaching experience of full-time teachers (average percentage)
C-11	Internal assessment
C-12	Internal/external examination related assessment
C-13	Course outcomes
C-14	Attainment of programme
C-15	Passing percentage of Students (last five years)
C-16	Review of Online teaching-learning process

Criteria 3 – Revolutions, Investigation, and Extension

C-1	Governmental and non-governmental agencies Grants
C-2	Recognizing as research guides (percentage of teachers)
C-3	Explore projects (percentage of departments)last five years
C-4	Ecosystem for innovations
C-5	Number of workshops/seminars (last five years)
C-6	Ph. Ds registered under per eligible teacher (last five years)
C-7	Publication research papers per teachers notified on the UGC (last five years)
C-8	Publication of books and chapters in national/ international conference proceedings per teacher (last five years)
C-9	Extension activities (last five years)
C-10	Receiving awards and extension activities from government/ government- recognized bodies (last five years)
C-11	NSS/ NCC/ Red Cross/ YRC etc. events (last five years)
C-12	Participation of students in extension activities (last five years)

Considering the above criteria and sub-criteria the data of 10 Engineering Colleges are shown in Table 1 and Table 2.

A. PROPOSED FLOWCHART

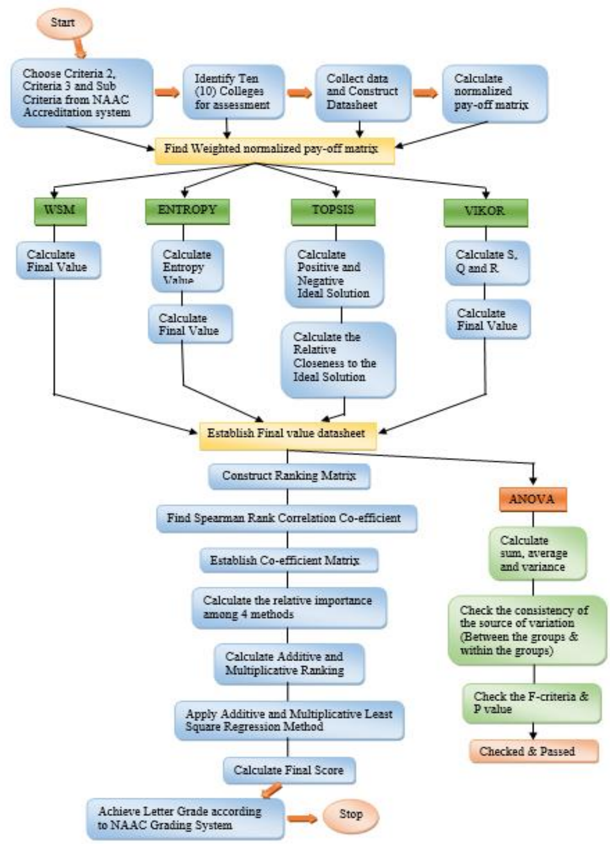


FIGURE 1. **Steps of the proposed methodology**

B. PROPOSED ALGORITHM

In this investigation, the proposed algorithm is given below:

STEP	Calculate the normalized pay-off matrix.
STEP 2	Calculate Weighted Normalized pay-off matrix.

LEVEL 1: MCDM APPROACHES

WSM:	
STEP 2.1.1	Establish final value datasheet.
ENTROPY:	
STEP 2.2.1	Calculate Entropy value.
TOPSIS:	
STEP 2.3.1	TOPSIS begins with a decision matrix having 16 attributes and 10 alternatives.
STEP 2.3.2	Determine the PIS and NIS as for each criterion: $A^* = \{v_1^*, v_2^*, \ldots\ldots, v_n^*\}$ where v_n^* gives the maximum value of nth criteria. $A^- = \{v_1^-, v_2^-, \ldots\ldots v_n^-\}$ where v_n^- gives the minimum value of nth criteria.
STEP 2.3.3	Calculate the distance of individually alternative from PIS and NIS and relative closeness to the ideal solution. $d_i^* = \sqrt{\sum_{j=1}^{n}(v_{ij} - v_j^*)^2}$ i = 1,2,3,….,J $d_i^- = \sqrt{\sum_{j=1}^{n}(v_{ij} - v_j^-)^2}$ i = 1,2,3,….,J where there are J alternatives and n criteria. $CC_i = \frac{d_i^-}{d_i^* + d_i^-}$ i = 1,2,3,…., J
VIKOR	
STEP 2.4.1	Calculate R, S and Q. $Q_i = \vartheta\left[\frac{S_i - S^*}{S^- - S^*}\right] + (1 - \vartheta)\left[\frac{R_i - R^*}{R^- - R^*}\right]$ where, Q_i represents the i-th VIKOR value, $i = 1,2,3 \ldots. m$; $S^* = Min\,(S_i);\ S^- = Max\,(S_i);\ R^* = Min\,(R_i);\ R^- = Max(R_i)$ and ϑ is the weight of the maximum group utility (usually it is to be set to 0.5).
STEP 2.4.2	The alternative having a minimum VIKOR value is determined to be the finest solution.

STEP 3	Establish final Criteria 2 and Criteria 3 datasheets w.r.to 10 colleges according to 4 MCDM techniques.
STEP 4	Construct Ranking Matrix corresponding Criteria 2 and Criteria 3.

LEVEL 2: ONE WAY ANOVA TESTING

STEP 4.1.1	Normalize the raw score.
STEP 4.1.2	Summing the square of the raw score for each attribute.
STEP 4.1.3	Normalize above values for each attribute.
STEP 4.1.4	Divide the normalized sum by degree of freedom (no. of alternatives – 1) to get the contribution of each attribute.
STEP 4.1.5	**Checked and Passed (Fig 4** and **Fig 5)**

LEVEL 3: GROUP DECISION MAKING

STEP 4.2.1	Calculate Spearman Correlation Co-efficient matrix.
STEP 4.2.2	Find relative importance among the 4 methods. $$\ell = 1 - \frac{6\sum_{a=1}^{n} d_a^2}{n^3 - n}$$ Where d_a = difference between ranks U_a and V_a achieved by the same alternative a, n = number of alternatives and $-1 \leq \ell \leq 1$.
STEP 4.2.3	Calculate **Additive** and **Multiplicative** ranking.

LEVEL 4 : LEAST SQUARE REGRESSION

STEP 5	Apply Least Square Additive and Multiplicative Regression Method.
STEP 6	Calculate **NAAC Score** of Engineering College w.r.to Criteria 2 and Criteria 3 both.

IV. RESULTS AND ANALYSIS

- In Level 1, after using MCDM procedures **WSM, ENTROPY, TOPSIS,** and **VIKOR**, we got the final datasheet of 10 Engineering Colleges according to Criteria 2 and Criteria 3. Also, we prepare a ranking structure of colleges w.r.to WSM, ENTROPY, TOPSIS and VIKOR under Criteria 2 and Criteria 3.In Level 2, we've checked if there any statistically considerable variations among the four techniques through applying ANOVA. Our checking is passed.
- In Level 3, we have applied Spearman Group Decision, Additive, and Multiplicative ranking to check relative importance among 4 methods, shown in Table 6 (Criteria 2 & Criteria 3). If we examine the information of table (stated earlier) with Table 7 **(**Characteristics of Co-efficient ℓ **),** it is clear that under Criteria 2 and Criteria 3, the relationship among 4 methods either **marked** or very strong which is shown in Table 8. That implies **WSM**, **ENTROPY**, **TOPSIS,** and **VIKOR** are strongly acceptable MCDM techniques for this study.

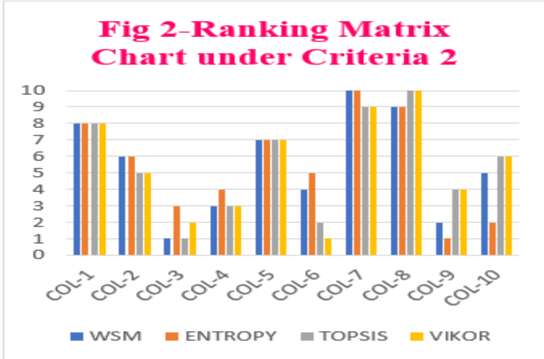
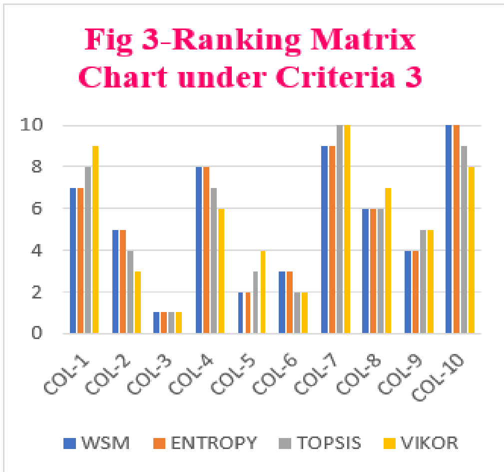


FIGURE 2. Ranking matrix chart under



Criteria 2

FIGURE 3. Ranking matrix chart under Criteria 3

- In Level 4, we have used Least Square Additive and Multiplicative Regression Method to evaluate the individual score w.r.to Criteria 2 and Criteria 3 respectively (Table 9 and Table 10).
- Now at the end of Level 4, finally we estimate **NAAC Score** w.r.to two Criteria together and their weights are given in Table 11.
- According to NAAC Grading System (**Table 12**), the letter grade of Engineering College is **B++** and the said College is **NAAC accredited**.

V. CONCLUSION

Modern universities present their students with various programs designed to prepare them for different economic sectors. Universities encourage lifelong learning; they offer opportunities to connect and attract professionals into training and technical development. When our educational institutions have anticipated achieving as decent as their worldwide associates, substantial scientific revolutions have to be implemented. Traditional methods for transporting higher education have become less encouraging to the vast number of students. In these scenarios, HEIs (Higher Education Institutions) are eager to enrich their teaching-learning system and quality-related research education system, etc., through continuous improvement programs. For quality evaluation, promotion and nourishment, NAAC acts a dynamic role.

In our proposed study, we have predicted the NAAC rating in step with the NAAC Grading System to collaborate with MCDM Techniques and Statistical Methodologies. It presents an excellent preference to the Engineering Colleges/Institutions to approximate their grade before the declaration of the result of the NAAC committee. According to their estimated value, the authorities can reform their ongoing policies of Assessment. With the assistance of our mathematical model Engineering Colleges/Institutions can increase their goodwill and maintain the tradition.

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APPENDIX

TABLE 1
DATASHEET OF 10 COLLEGES CONSIDERING CRITERIA 2 (RENOGNIZED BY NAAC)

Weight (330)	10	10	20	20	20	20	10	30	20	30	20	30	20	10	10	50
Criteria / College	C-1	C-2	C-3	C-4	C-5	C-6	C-7	C-8	C-9	C-10	C-11	C-12	C-13	C-14	C-15	C-16
Col-1	77	23.66	3	17.51	6	16	21.64	95.86	27.6	9.7	8	8	4	2	87.15	3.21
Col-2	90.4	71.42	3	21.4	7	72.73	22.15	100	31.1	9.88	2	4	1	2	87.18	3.41
Col-3	71.7	100	3	10.98	2	100	10.98	102.8	17	11.84	9	5	2	2	97.24	3.45
Col-4	85	100	3	15.13	15	75.86	15.13	84.38	10.7	10.38	6	5	5	2	89.76	3.45
Col-5	98.1	93.73	2	20.24	3	100	23.64	94.84	16.3	12.11	2	3	3	3	98.74	3.27
Col-6	82.4	50.94	3	16.21	4	92.41	19.7	100	12.2	12.02	3	2	3	4	96.78	3.49
Col-7	50.5	76.02	2	25.37	1	55.26	43.82	92.5	55.1	4.89	1	1	1	1	56	3.41
Col-8	2.96	99	3	9.8	3	39.83	15.84	76.24	85	9.78	4	0.6	2	2	78.9	3.35
Col-9	91.1	89.64	8	16.13	4	100	16.13	100	14.6	8.16	9	5	10	1	84.79	3.35
Col-10	94.1	100	4	301.18	3	84.85	93.5	86.11	21.5	10.89	4	2	8	2	95.79	3.28

TABLE 2
DATASHEET OF 10 COLLEGES CONSIDERING CRITERIA 3 (RENOGNIZED BY NAAC)

Weight (120)	5	5	5	5	5	5	10	10	10	10	15	15	10	10
Criteria / College	C-1	C-2	C-3	C-4	C-5	C-6	C-7	C-8	C-9	C-10	C-11	C-12	C-13	C-14
Col-1	0	6.36	0	0.875	52	1.45	0.89	1.24	0.428	13	49	40.92	191	7
Col-2	27.08	11.36	1.32	0.625	8	0.1	0.16	1.61	0.571	12	219	46.12	119	23
Col-3	355.14	16.26	1.73	0.25	370	0.73	1.91	2.11	1	113	128	85.22	1007	194
Col-4	55.59	4.83	0.03	1	67	0.57	0.36	1.08	0.428	10	65	56.41	77	12
Col-5	8.02	4.79	1.11	9	85	0.71	2.27	2.12	7	92	95	29.38	508	13
Col-6	14.63	5.06	0.15	2	84	2.38	3.16	0.8	3	42	51	93.46	3270	59
Col-7	1.25	13.16	0.01	2	2	1.6	0.09	1.05	4	10	31	20.95	15	7
Col-8	547.71	0	0.6	2	0	1.39	1.37	1.21	3	0	5	46.39	2.6	16
Col-9	44.49	2.75	0.17	7	51	1.2	2.8	0.76	3	3.1	63	82.8	116	39
Col-10	46.31	4.04	0.08	3	14	0.38	0.85	0.84	6	8	25	5.67	93	6

TABLE 3
DATASHEET OF 10 COLLEGES ACCORDING TO 4 MCDM TECHNIQUES (CRITERIA 2 & CRITERIA 3)

Method/Colleges	CRITERIA 2				CRITERIA 3			
	WSM	ENTROPY	TOPSIS	VIKOR	WSM	ENTROPY	TOPSIS	VIKOR
COL-1	2.7918	2.8776	2.7951	2.8314	0.7020	0.8376	0.7776	0.7044
COL-2	3.3660	3.4056	3.5376	3.3957	1.1832	1.1076	1.3620	1.5204
COL-3	4.2108	3.8544	4.0722	4.1646	2.4888	2.2140	2.0340	1.9644
COL-4	3.8709	3.7851	3.8445	3.9831	0.6708	0.7836	0.8640	0.8736
COL-5	2.9898	3.1680	2.8809	2.9370	1.8228	1.7556	1.5816	1.4412
COL-6	3.8346	3.5805	3.8841	4.2867	1.7748	1.6416	1.6512	1.7652
COL-7	1.9932	2.0031	2.6466	2.6631	0.6516	0.7740	0.7224	0.6432
COL-8	2.2506	2.4156	2.5476	2.3199	0.8976	0.9876	0.9360	0.8496
COL-9	4.1217	4.0260	3.7521	3.3990	1.2516	1.2360	1.3368	1.4232
COL-10	3.5706	3.8808	3.0360	3.0195	0.5544	0.6624	0.7344	0.8112

TABLE 4
RANKING MATRIX (CRITERIA 2 & CRITERIA 3)

Method/Colleges	CRITERIA 2				CRITERIA 3			
	WSM	ENTROPY	TOPSIS	VIKOR	WSM	ENTROPY	TOPSIS	VIKOR
COL-1	8	8	8	8	7	7	8	9
COL-2	6	6	5	5	5	5	4	3
COL-3	1	3	1	2	1	1	1	1
COL-4	3	4	3	3	8	8	7	6
COL-5	7	7	7	7	2	2	3	4
COL-6	4	5	2	1	3	3	2	2
COL-7	10	10	9	9	9	9	10	10
COL-8	9	9	10	10	6	6	6	7
COL-9	2	1	4	4	4	4	5	5
COL-10	5	2	6	6	10	10	9	8

TABLE 5
STEPS OF ANOVA (CRITERIA 2 & CRITERIA 3)

ANOVA: Single Factor (CRITERIA 2)

SUMMARY

Groups	Count	Sum	Average	Variance
Column 1	10	33	3.3	0.595279
Column 2	10	32.9967	3.29967	0.461875
Column 3	10	32.9967	3.29967	0.332011
Column 4	10	33	3.3	0.444774

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	1.09E-06	3	3.63E-07	7.92E-07	1	2.866266
Within Groups	16.50545	36	0.458485			
Total	16.50545	39				

ANOVA: Single Factor (CRITERIA 3)

SUMMARY

Groups	Count	Sum	Average	Variance
Column 1	10	11.9976	1.19976	0.413252
Column 2	10	12	1.2	0.262451
Column 3	10	12	1.2	0.210624
Column 4	10	11.9964	1.19964	0.227837

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	9.72E-07	3	3.24E-07	1.16E-06	1	2.866266
Within Groups	10.02748	36	0.278541			
Total	10.02748	39				

TABLE 6
RELATIVE IMPORTANCE AMONG 4 METHODS(CRITERIA 2 & CRITERIA 3)

Methods	WSM	ENTROPY	TOPSIS	VIKOR	SUM	No of considered colleges	AVG	RANK
CRITERIA 2								
WSM	1.0000	0.9030	0.9273	0.8909	3.721	10	0.372	1
ENTROPY	0.9030	1.0000	0.7455	0.7212	3.370	10	0.337	4
TOPSIS	0.9273	0.7455	1.0000	0.9879	3.661	10	0.366	2
VIKOR	0.8909	0.7212	0.9879	1.0000	3.600	10	0.360	3
CRITERIA 3								
WSM	1.0000	1.0000	0.9515	0.8545	3.806	10	0.381	2
ENTROPY	1.0000	1.0000	0.9515	0.8545	3.806	10	0.381	2
TOPSIS	0.9515	0.9515	1.0000	0.9636	3.867	10	0.387	1
VIKOR	0.8545	0.8545	0.9636	1.0000	3.673	10	0.367	4

TABLE 7
CHARACTERISTICS OF Co-EFFICIENT ℓ

Correlation	Nature of	Remark
0.9 - 1.0	Very High	**Very Strong**
0.7 – 0.9	High	**Marked**
0.4 – 0.7	Moderate	Substantial
0.2 – 0.4	Low	Definite
< 0.2	Slight	Small

TABLE 8

NATURE OF RELATIONSHIP AMONG 4 MCDM TECHNIQUES

Relation between MCDM techniques	Correlation	Nature of relation (Criteria 2)	Correlation	Nature of relation (Criteria 3)
WSM and ENTROPY	0.9030	very strong	1.0000	very strong
WSM and TOPSIS	0.9273	very strong	0.9515	very strong
WSM and VIKOR	0.8909	Marked	0.8545	Marked
ENTROPY and TOPSIS	0.7455	Marked	0.9515	very strong
ENTROPY and VIKOR	0.7212	Marked	0.8545	Marked
TOPSIS and VIKOR	0.9879	very strong	0.9636	very strong

TABLE 9

INDIVIDUAL SCORE W.R.TO CRITERIA 2

	Additive				Multiplicative			
	X	Y=mx+b	X^2	XY	X	Y=mx+b	X^2	XY
CRITERIA 2	1.0128	???			1.0124	???		
	1.2294	3.17	1.5114	3.8972	1.2282	3.17	1.5085	3.8934
	1.4639	3.4	2.1431	4.9773	1.4604	3.4	2.1327	4.9653
	1.3893	2.75	1.9301	3.8205	1.3876	2.75	1.9255	3.816
	1.0730	3.38	1.1513	3.6267	1.0727	3.38	1.1508	3.6259
	1.3996	3.31	1.9589	4.6327	1.3941	3.31	1.9436	4.6146
	0.8361	2.71	0.699	2.2657	0.8258	2.71	0.6819	2.2379
	0.8548	2.94	0.7307	2.5131	0.8536	2.94	0.7287	2.5096
	1.3719	3.38	1.8821	4.637	1.3675	3.38	1.8701	4.6221
	1.2087	2.91	1.4609	3.5173	1.2037	2.91	1.4488	3.5027
SUM	**10.6307**	**25.0400**	**12.0066**	**30.3702**	**10.7936**	**27.9500**	**13.3906**	**33.7875**
m	2.4637				0.5994			
b	0				2.3867			
Y_COL 1	**2.9920**				**2.9935**			

TABLE 10

INDIVIDUAL SCORE W.R.TO CRITERIA 3

	Additive				Multiplicative			
	X	Y=mx+b	X^2	XY	X	Y=mx+b	X^2	XY
CRITERIA 3	0.2863	???			0.2853	???		
	0.4892	3.24	0.2393	1.5851	0.4861	3.24	0.2363	1.5749
	0.8245	2.62	0.6797	2.1601	0.8204	2.62	0.673	2.1494
	0.3021	3	0.0913	0.9064	0.3006	3	0.0903	0.9017
	0.6257	3.02	0.3915	1.8896	0.6224	3.02	0.3874	1.8796
	0.6468	3.37	0.4183	2.1796	0.6465	3.37	0.418	2.1787
	0.2645	2.82	0.07	0.746	0.2635	2.82	0.0694	0.7431
	0.3479	1.35	0.121	0.4696	0.3470	1.35	0.1204	0.4685
	0.4966	2.48	0.2466	1.2316	0.4960	2.48	0.2461	1.2302
	0.2613	1.43	0.0683	0.3736	0.2590	1.43	0.0671	0.3704
SUM	**4.2586**	**23.3300**	**2.3260**	**11.5416**	**4.2415**	**23.3300**	**2.3080**	**11.4965**
m	1.6159				1.6229			
b	1.8276				1.8274			
Y_COL 1	**2.2903**				**2.2904**			

TABLE 11
FINAL NAAC SCORE

Weight	3.3	1.2	Final NAAC Score
Criteria	Criteria 2	Criteria 3	
Grade	2.99275	2.29035	**2.81**

TABLE 12
NAAC GRADING SYSTEM

Range of Institutional Cumulative Grade Point Average (CGPA)	**Letter Grade**	**Status**
3.51-4.00	A++	Accredited
3.26-3.50	A+	Accredited
3.01-3.25	A	Accredited
2.76-3.00	B++	Accredited
2.51-2.75	B+	Accredited
2.01-2.50	B	Accredited
1.51-2.00	C	Accredited
≤ 1.50	D	Not Accredited