QUALITY OF NIRF 2020 RANKED MANAGEMENT INSTITUTIONS

Abstract

Problem-With the increase in the number of MBA institutions in India Quality of students will be the deciding factor for competitive advantage for institutions .Quality starts with Quality by design which means that a product or service is designed with the aim of fulfilling the customer expectations .The service reaches the end customer by passing through a series of internal customers and the expectations of all customers should be fulfilled.

Objectives – 1.To find out the performance and Quality of top ranked Management Institutions in various parameters in NIRF.2. To plot a radar to show the variations in the average Median salary offered in last 3 years in the top 75 ranked management institutions with rank 2020.3. To design a regression model for **the overall score** in NIRF rankings as dependent variable and various parameters in NIRF as independent variables.

Findings - In 6 parameters out of the 15 more than 50% of the institutions score less than 50% marks .The regression model obtained explains 99.2% of the variation in the dependent variable with NIRF Parameters and hence is a good fit .

Originality – The study is unique in finding what was common and not so common in the institutions which ranked between 1 to 75 in NIRF Rankings. It helped in finding what helped these institutions in standing out from the crowd.

Keywords- Quality by Design, NIRF Ranking, Regression Model, Quality Management

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I. INTRODUCTION

Launched in 2015 and approved by Ministry of Human Resource Development " National Institutional Ranking Framework" outlines a methodology to rank institutions across the country and the Core Committee was set up to identify broad parameters for ranking various institutions and universities according to (National Institutional Ranking Framework (NIRF), 2017) .The different parameters related to NIRF are shown in Figure 1

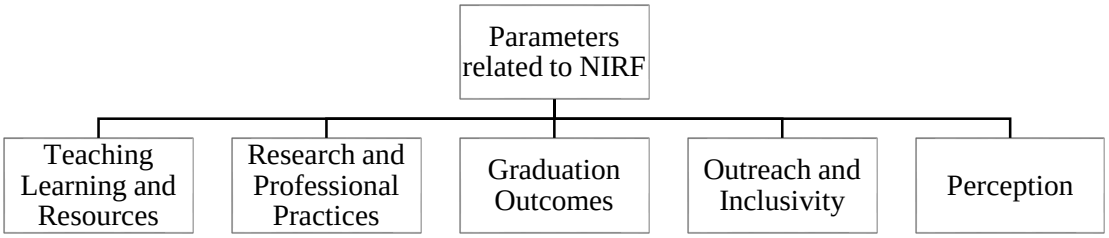

Figure 1: Parameters related to NIRF

The fees to apply for NIRF is high and it may be a reason for very less number of institutions participating in NIRF Ranking Framework but the number of institutions applying for NIRF Ranking process is on the rise since 2018 as evident from Figure 2 .

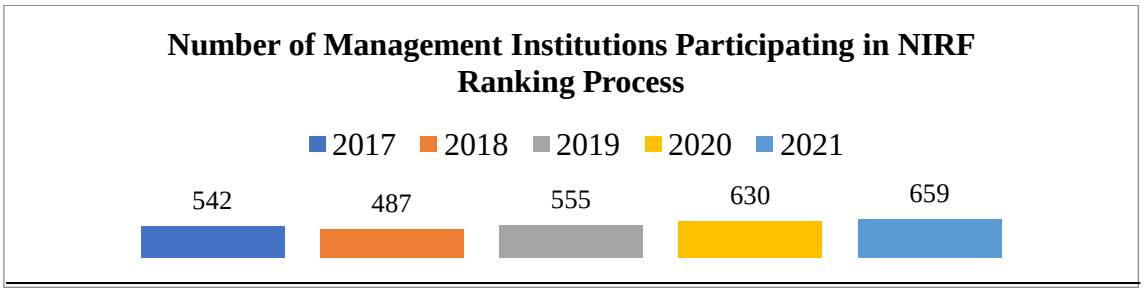

Figure 2: Number of Management Institutions Participating in NIRF Ranking Process

(Team, Nirfindia.org>about>ranking>2018>Management>List of participating institutions, 2018)
(Team, nirfindia.org>ranking>2017>Management>List of Participating Institutions, 2017)
(Team, nirfindia.org>ranking>2019>Management>List of Participating Institutions, 2019)
(Team, nirfindia.org>ranking>2020>Management>List of participating institutions, 2020)
(Team, nirfindia.org>ranking>2021>Management>List of participating institutions, 2021)

The 630 institutions which participated in NIRF Ranking Process in 2020 were from 23 states out of the 28 states of India and 3 Union Territories out of the 8 Union Territories. In top 75 there were institutions from 19 states and 2 Union Territories . As the participation is not from all States and Union Territories it shows that either the institutions present in non-participating areas are not financially sound to pay the fees or are not aware about NIRF Ranking or their focus is not to find out where they stand among their competitors in providing quality education.

II. LITERATURE REVIEW

According to (Hameed, 2020) the National Institutional Ranking Framework rankings 2020 were released on 11th June 2020 by Honourable Minister of Human Resource

Development Ramesh Pokhriyal Nishank. NIRF criteria was revised four times from 2017 to 2020 which is an indicator that the NIRF criteria is an updated criteria .In 2021 the NIRF criteria 2020 is retained without any changes . The parameters are segregated as inputs and output parameters as shown in Table 1.The 5 major components of teaching are Teacher, Teaching Methodology, Instruction Material, Infrastructure and Learning as mentioned in (Mangal & Mangal, 2018) .

Table 1: Segregation of NIRF Parameters as Inputs and Outputs (Team, Ranking Metrics for Management)

Inputs			**Output**	
Teacher related	Student related	Finance related	Student related	Faculty related
Faculty-student ratio with emphasis on permanent faculty (FSR)	Student Strength including Doctoral Students(SS)	Financial Resources and their Utilisation (FRU)	Combined metric for Publications (PU): Combined metric for Quality of Publications (QP)	Combined metric for Publications (PU): Combined metric for Quality of Publications (QP)
Combined metric for Faculty with PhD (or equivalent) and Experience (FQE):	Faculty-student ratio with emphasis on permanent faculty (FSR)		Combined metric for Placement and Higher Studies (GPH): 40 marks	Footprint of Projects, Professional Practice and Executive Development Programs/ Management Development Programs (FPPP)
Footprint of Projects, Professional Practice and Executive Development Programs/ Management Development Programs (FPPP)	Percentage of Students from Other States (Region Diversity RD)		Metric for University Examinations (GUE)	
Percentage of Women (Women Diversity WD)	Economically and Socially Challenged Students (ESCS)		Median Salary (GMS)	
	Facilities for Physically Challenged Students (PCS)		Peer Perception: Employers & Academic Peer (PR):	
	Percentage of Women (Women Diversity WD)			

Out of the 15 parameters distributed in 5 categories only a few have an expected limit like Faculty Student Ratio with emphasis on Permanent Faculty (FSR) which has a limit of 1:15, Percentage of Women (Women Diversity WD) has an expectation of 50% women students and 20% women faculty.

Financial Resource Utilization (FRU) does not consider expenditure on construction of new buildings and maintenance of hostels and allied services in NIRF criteria according to (Team, Ranking Metrics for Management) but ideally these things increase student satisfaction if they are maintained well and are well constructed .Customer satisfaction increases with better facilities in terms of infrastructure and services like canteen, sports, library etc.

The Combined metric for Placement and Higher studies (GPH) and Median Salary (GMS) only considers placements and selections of graduating students for higher study in PG programs and median salary of graduates in PG programs and placements at undergraduate level and selections for higher study at undergraduate level are not considered.

The parameter Economically and Socially Challenged Students (ESCS) considers only the percentage of PG students being provided full tuition fee reimbursement.

The parameter Facilities for Physically Challenged students (PCS) does not specify which facilities are required in the category whether it is ramp, lifts, separate toilets for physically challenged or anything else.

Overall the framework does not stipulate anything related to relevance of curriculum explicitly with respect to different sector Employer Requirements, Facilities for Physically Challenged, UG student results in terms of Placements and Enrolments in Higher Studies and Median Salary, Sports and Cultural achievements of students. Also, the framework has no point related to Teaching Methodology and Instruction Material.

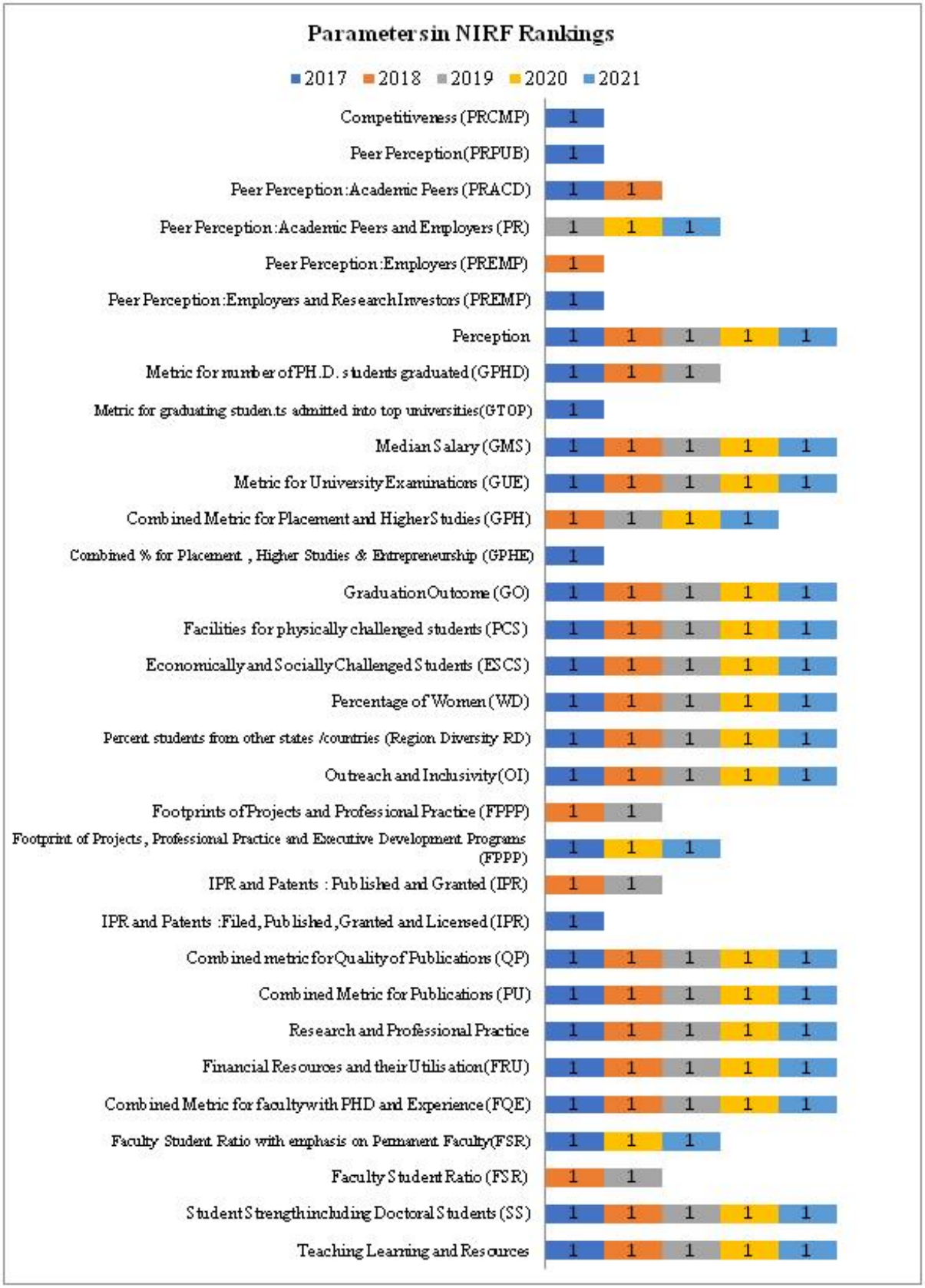

Figure 3: NIRF Ranking Parameters and sub-parameters from 2017 to 2021

III. OBJECTIVES OF RESEARCH

1) To find out the performance of top ranked Management Institutions in various parameters in NIRF.
2) To plot radar to show the variations in the average Median salary offered in last 3 years in the top 75 ranked management institutions with rank 2020.
3) To design a regression model for **the overall score** in NIRF rankings as dependent variable and various parameters in NIRF as independent variables.

IV. RESEARCH METHODOLOGY

The Research Design is Exploratory in nature as it analyses the scores obtained by top 75 ranked Management Institutions in India in the criteria given in NIRF . The research can be classified into different categories based on the different objectives .It uses Inductive Approach as specified in (Nayak P. J.) as the sample size is 75 and the collected data is used for formulation of a regression model .This model can be used by institutions to determine the probable rank of an institution based overall score computed from scores in different parameters .Megastat and Data Analysis toolpak of Microsoft Excel were used for analysis.

V. HYPOTHESES FORMULATION

The formulated Hypotheses are shown in Table 2

Table 2: Formulated Hypotheses

S. No	Hypothesis	Description	Statistical Test Applied
1.	H_O H_A	It is believed that top quality institutions are present in all states of India. It is believed that top quality institutions are not present in all states of India.	Chi Square Goodness of Fit Test

VI. DATA ANALYSIS AND FINDINGS

Findings based on NIRF Management Ranking Results 2020 of 1 to less than 75th ranked institution are shown below –

1) The results in the parameter **Student Strength Including Doctoral Students** show that among the institutions scoring between 0 to less than 5 % to the institutions scoring between 95to less than 100% maximum 16 % of institutions score from 60 to less than 65 % .20 is the maximum score for this parameter as evident from Figure 4.

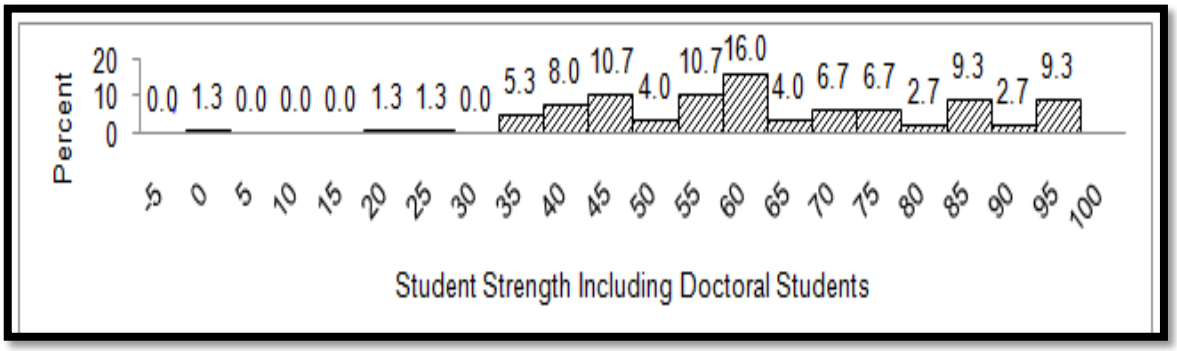

Figure 4: Histogram showing results for the parameter student strength including doctoral students for top 75 NIRF Ranked Management Institutions in 2020

2) Figure 5 shows results in the parameter **Faculty student ratio with emphasis on permanent faculty** depicting a skewed frequency distribution with 53.3 % of institutions in the top 75 ranks scoring 100% marks .The lowest scores obtained in this category are between 55 to less than 60 percent with only 1.3% institutions scoring that and the rest of the institutions scoring between 70 to less than 100 percent on a scale of 30.

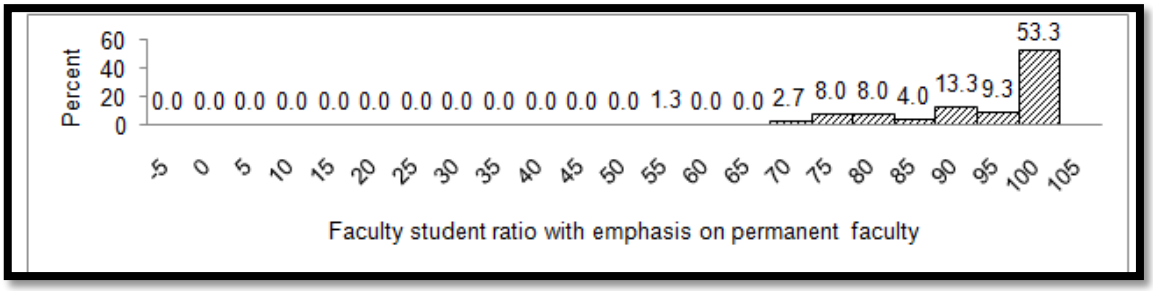

Figure 5: Histogram showing results for the parameter faculty student ratio with emphasis on permanent faculty for top 75 NIRF Ranked Management Institutions in 2020

3) Figure 6 shows results for **Combined metric for faculty with PHD and experience** and highlights that only 2.7% institutions score between 55 to less than 60 % marks and highest 22.7 % institutions in the top 75 Management Institutions score between 85 to less than 90 % marks .None of the institutions has scores less than 55 % on a scale of 20 .

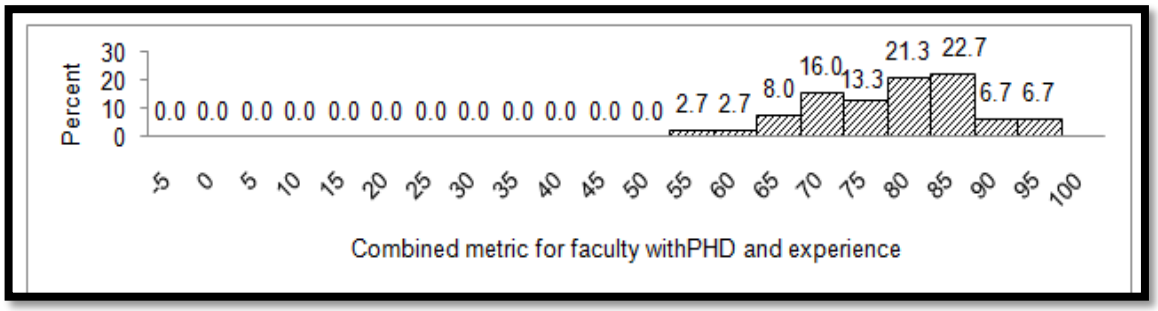

Figure 6: Histogram showing results for the parameter Combined metric for faculty with PHD and experience for top 75 NIRF Ranked Management Institutions in 2020

4) Figure 7 shows results related to the parameter Financial resources and their utilisation where variation in scores is from 10 % to less than 95% with maximum 14.7% of the institutions in top 75 scoring between 30 to less than 35% .The maximum possible score in this category is 30 .

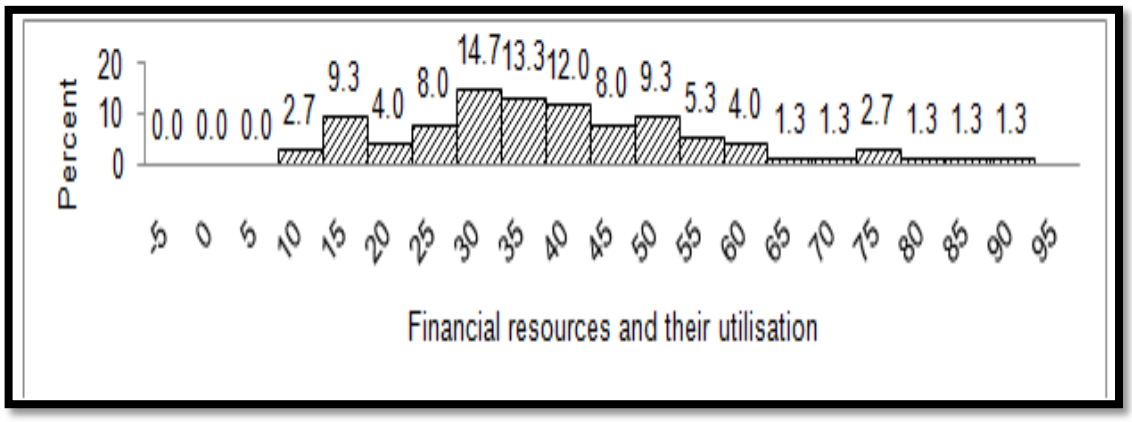

Figure 7: Histogram showing results for the parameter Financial Resources and their Utilization for top 75 NIRF Ranked Management Institutions in 2020

5) Figure 8 shows results for the parameter Combined metric for publications .Here a right tailed skewed frequency distribution is evident with highest 28% of top 75 Management Institutions scoring between 0to less than 5% and 1.3% institutions scoring between 85to less than 90 % .No institute was able to score 100% on a scale of 40.

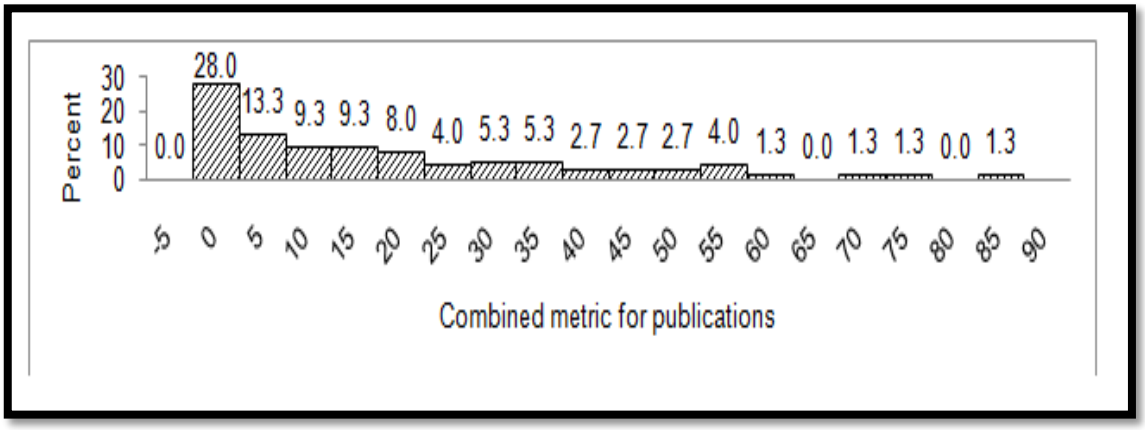

Figure 8: Histogram showing results for the parameter Combined Metric for Publications for top 75 NIRF Ranked Management Institutions in 2020

6) The histogram Figure 9 is for the parameter Combined metric for Quality of publications and shows that 13.3% of institutions in top 75 Management Institutions scored between 20to less than 25% marks and only 1.3% scored 100% .The scores varied from 0 to 100

% .None of the institutions scored between greater than 70 and less than 90 % on a scale of 40.

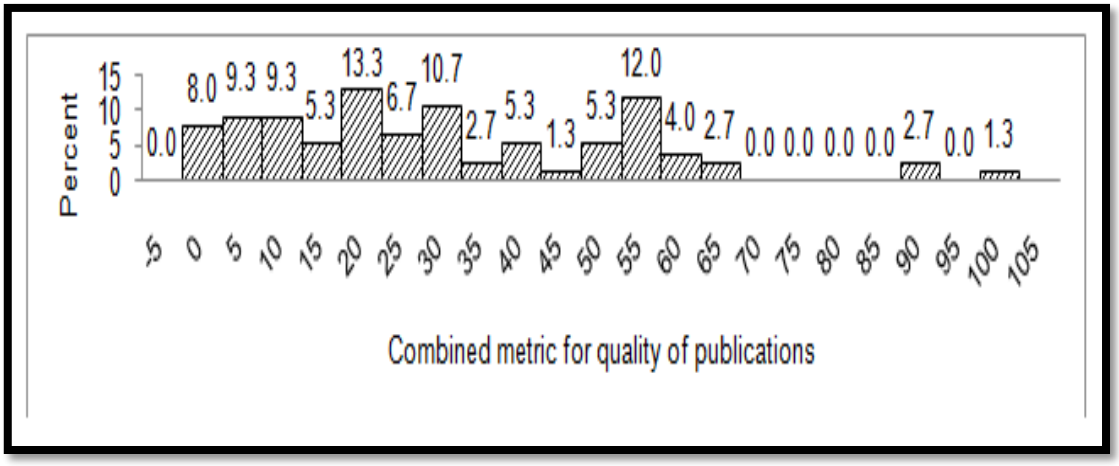

Figure 9: Histogram showing results for the parameter Combined metric for Quality of Publications for top 75 NIRF Ranked Management Institutions in 2020

7) The scores in the parameter Footprints of projects, professional practice and executive development programmes showed a right tailed skewed frequency distribution with maximum 38.7% institutions in top 75 Management Institutions scoring between 0 to less than 5% .The maximum score obtained by any institution among the top 75 Management Institutions was between 60 to less than 65% on a scale of 20 as shown in Figure 10.

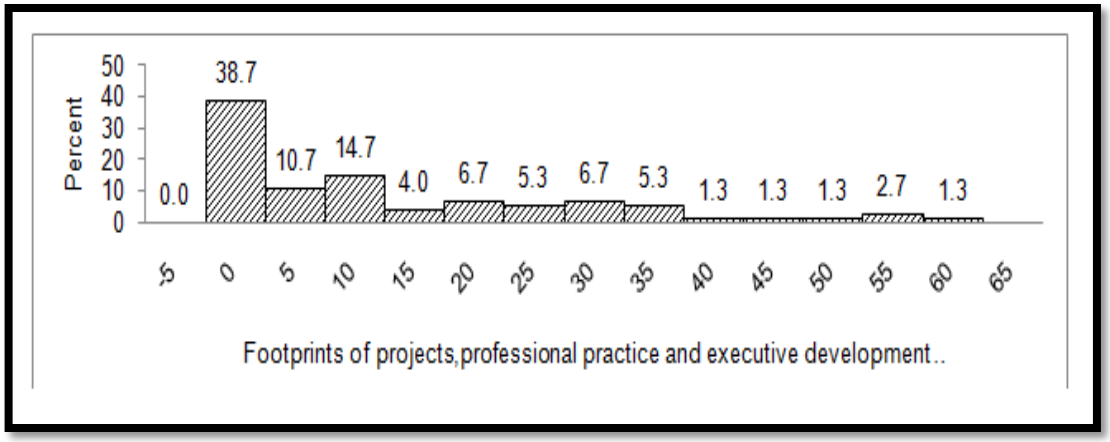

Figure 10: Histogram showing results for the parameter Footprints of projects, professional practice and executive development programmes for top 75 NIRF Ranked Management Institutions in 2020.

8) The scores in the parameter on Combined metric for placement and higher studies showed a left tailed skewed frequency distribution with 1.3% institutions scoring between 20 to less than 25% and 21.3% institutions scoring between 90 to less than 95 % on a scale of 40 as shown in Figure 11.

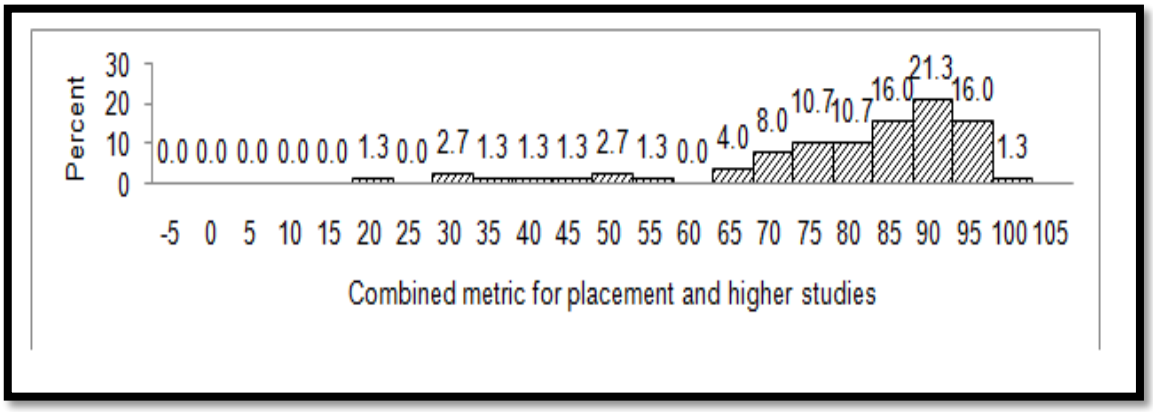

Figure 11: Histogram showing results for the Combined metric for placement and higher studies for top 75 NIRF Ranked Management Institutions in 2020

9) The Figure 12 shows scores in the parameter Metric for University Examinations which were 100% for maximum 85.3% institutions on a scale of 20 .The remaining 14.7% institutions scored between 55 to less than 60,75 to less than 80,90 to less than 95 and 95 to less than 100 % .

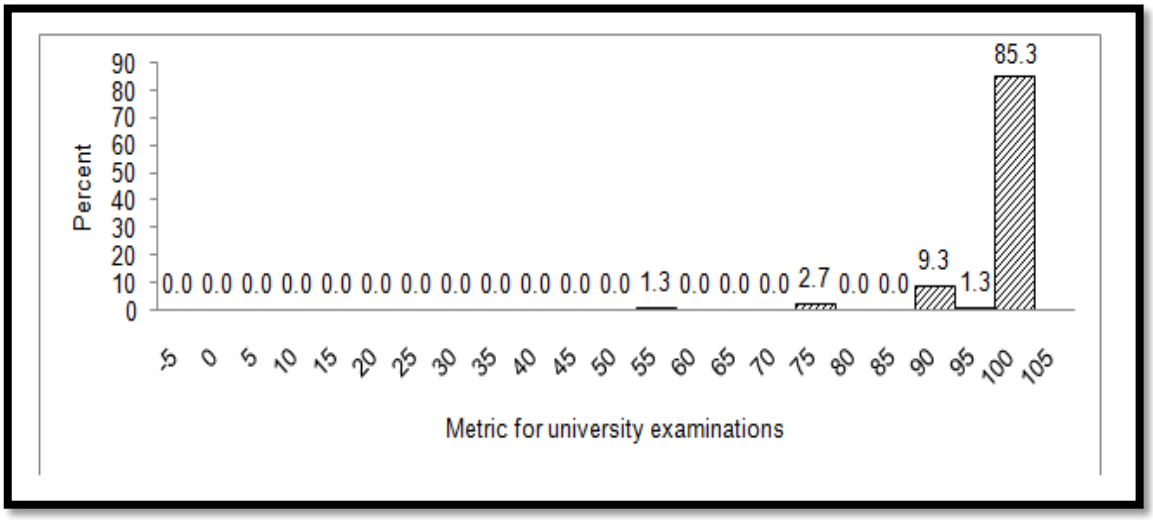

Figure 12: Histogram showing results for Metric for University Examinations for top 75 NIRF Ranked Management Institutions in 2020

10) The Median Salary scores are shown in Figure 13 which varied between 25 to 100% on a scale of 40 .Maximum 13.3% institutions scores between 55 to less than 60 .None of the institutions scored less than 25% marks in this parameter .The overall ranks given did not correspond totally with the variation in the 3 years Average Median Salaries offered to various institutions as 1st ranked institution had a maximum 3years average Median Salary of 23 lakhs and the 71st ranked institution had the minimum of 2 lakhs . The correlation coefficient between rank and 3 years average median salary was -0.81231 which showed that with the increase in the rank the chances are that 0.81 times the median average salary will decline .The Figure 14 shows the radar between median average salary and rank.

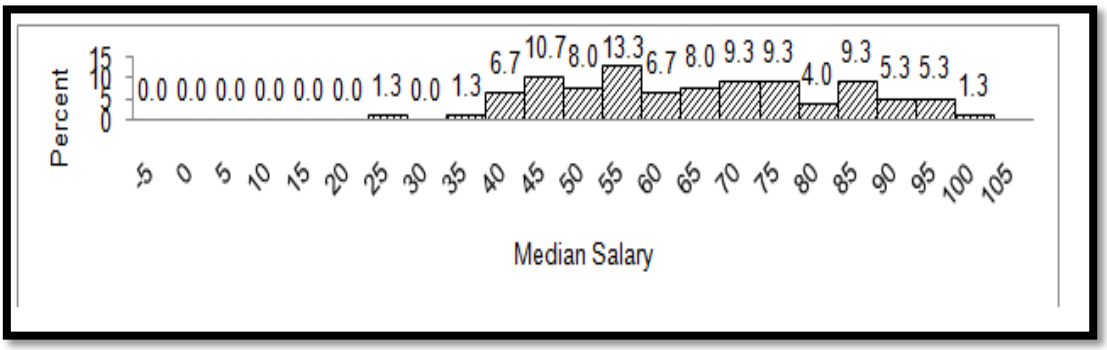

Figure 13: Histogram showing results for the Median Salary for top 75 NIRF Ranked Management Institutions in 2020

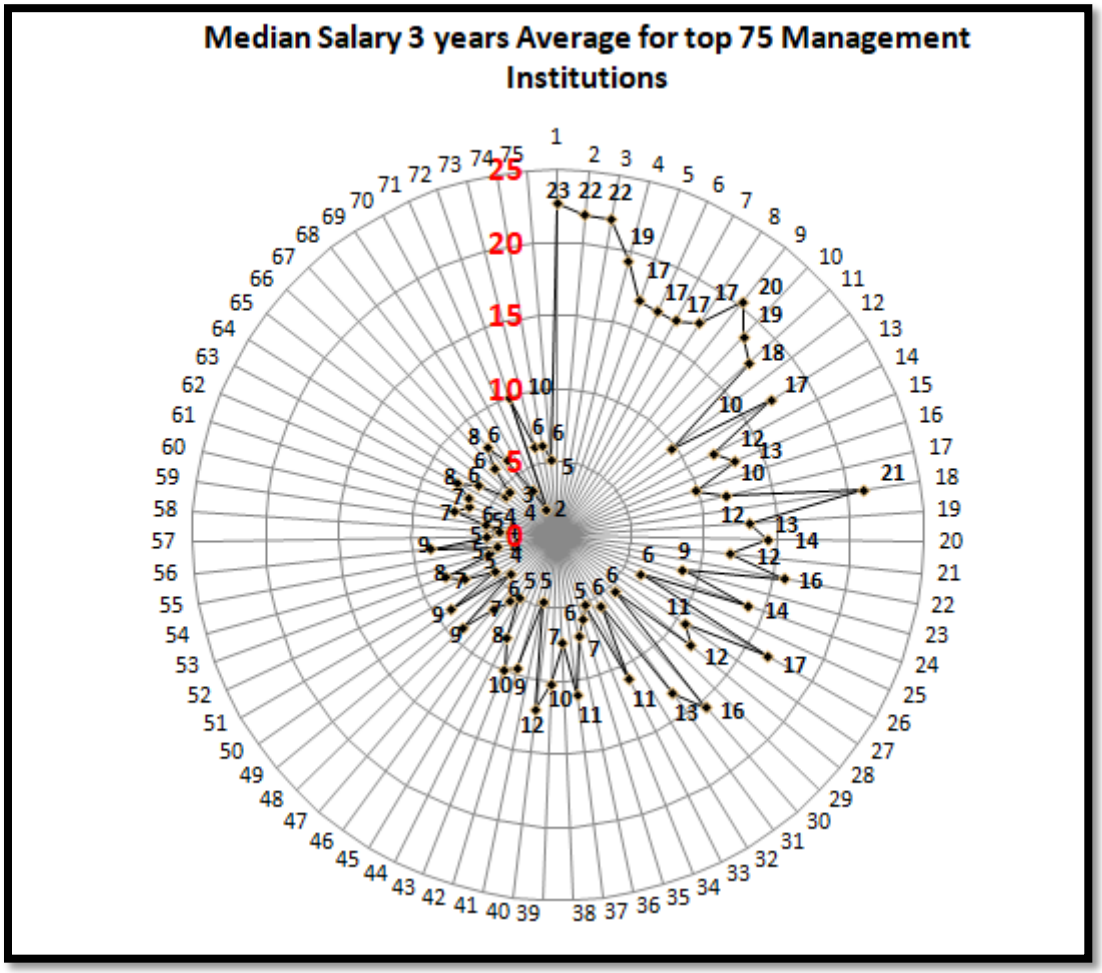

Figure 14: Three years average of median salaries of top 75 NIRF Ranked Management Institutions in 2020 (Team, nirfindia.org>ranking>2020>Management, 2020)

11) The Figure 15 shows scores on the parameter Percentage of Students from Other States (Region Diversity RD) which varied from 0 to 100 % .Maximum 13.3% institutions scored between 85 to less than 90 % on a scale of 30.

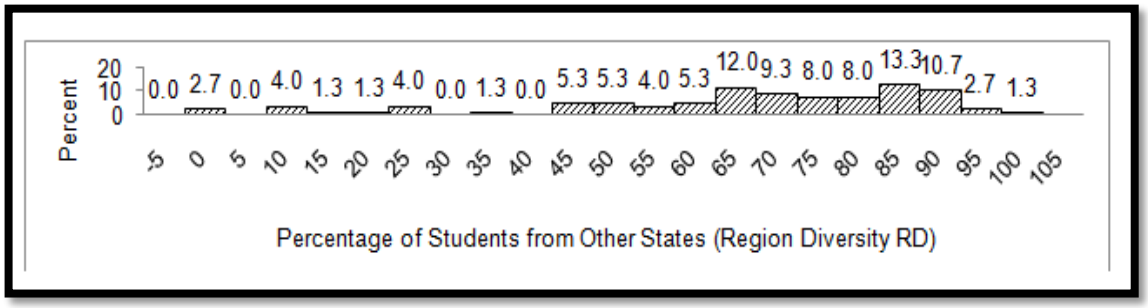

Figure 15: Histogram showing results for Percentage of Students from Other States (Region Diversity RD) for 1to less than 75th rank Management Institutions

12) The results in the parameter on Women Diversity representing percentage of Women showed 17.3% institutions scoring between 75 to less than 80 percent .4% of the institutions scored 100 % which was 30 marks as evident in Figure 16.

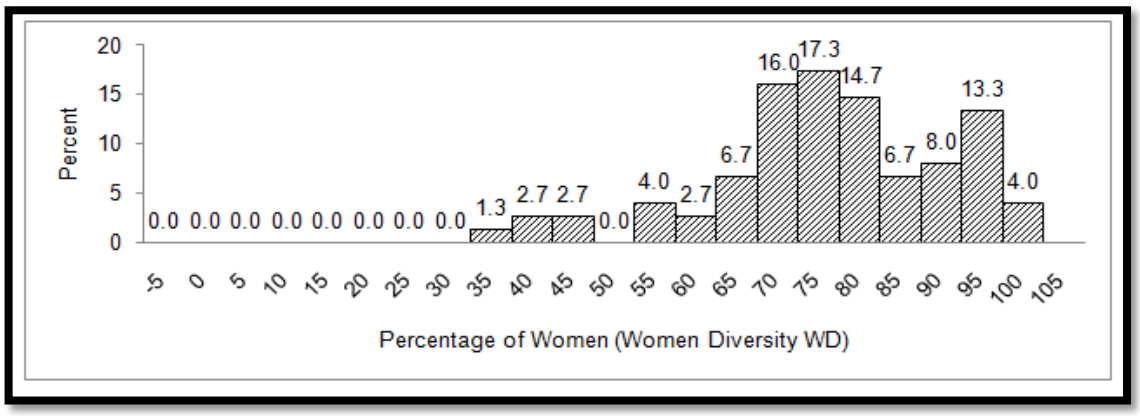

Figure 16: Histogram showing results for Percentage of Women (Women Diversity WD) for 1to less than 75th rank Management Institutions

13) The scores in the parameter Economically and Socially Challenged Students (ESCS) showed a right tailed skewed frequency distribution with 78.7% institutions scoring between 0 to less than 5% on a scale of 20 as shown in Figure 17 below.

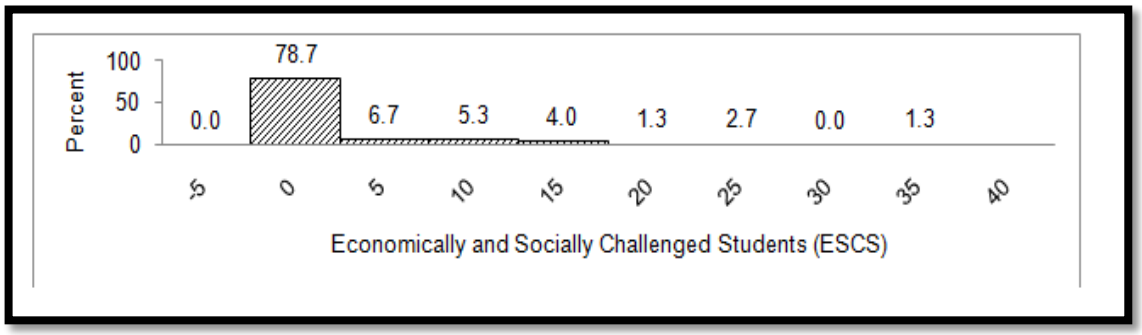

Figure 17: Histogram showing results for economically and socially challenged students (ESCS) for 1to less than 75th rank Management Institutions

14) The scores in the parameter Facilities for Physically Challenged Students (PCS) displayed in Figure 18 showed an almost left tailed frequency distribution with 86.7% institutions scoring 100% .The remaining 13.3% of the institutions scored between 25 to less than 30 , 70 to less than 85 and 90 to less than 95 on a scale of 20.

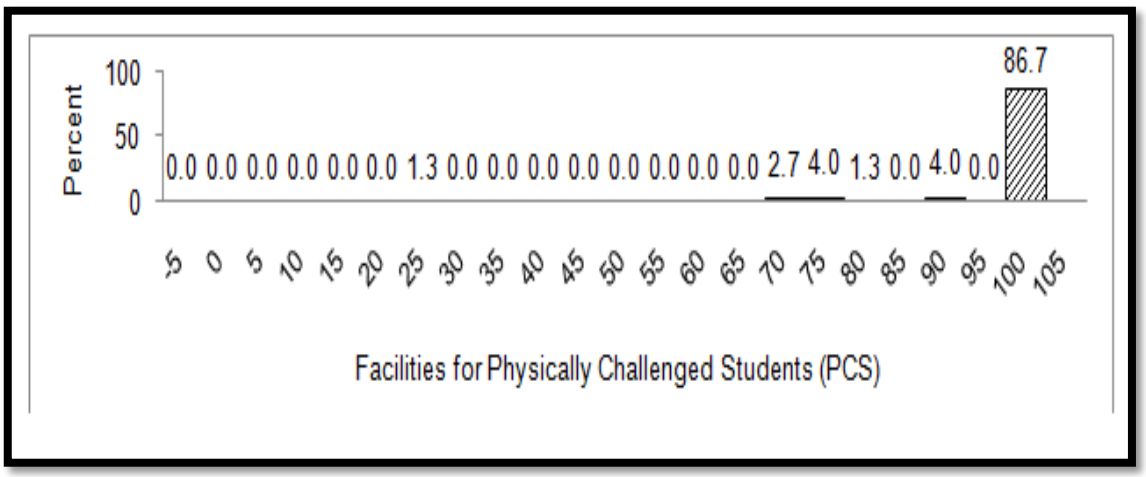

Figure 18: Histogram showing results for Facilities for Physically Challenged Students (PCS) for 1to less than 75th rank Management Institutions

15) The results of the evaluation on the parameter Peer Perception: Employers & Academic Peer (PR) show that maximum 20 % of the institutions score between 0 to less than 5 % and 1.3% institutions scoring 100 percent on a scale of 100 as showcased in Figure 19.

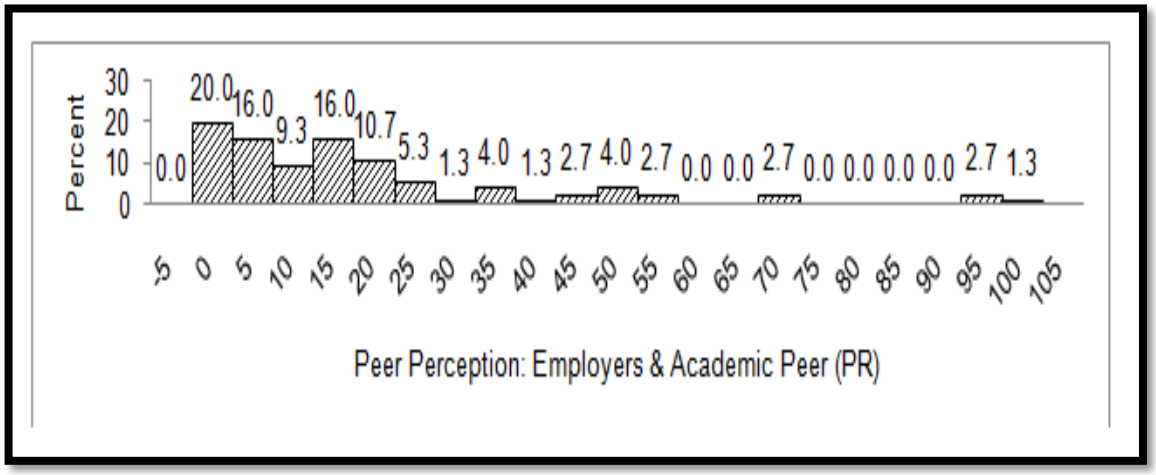

Figure 19: Histogram showing results for Peer Perception: Employers & Academic Peer (PR) for 1to less than 75th rank Management Institutions

16) Overall scores are shown in Figure 20 which represents that maximum 30.7% of the institutions scored between 45 to less than 50 % and no institutions in top 75 Management Institutions scored less than 40 on a scale of 100 .Hence it can be concluded that overall any institution has to score more than 40 to be in top 75 NIRF ranked Management Institutions.

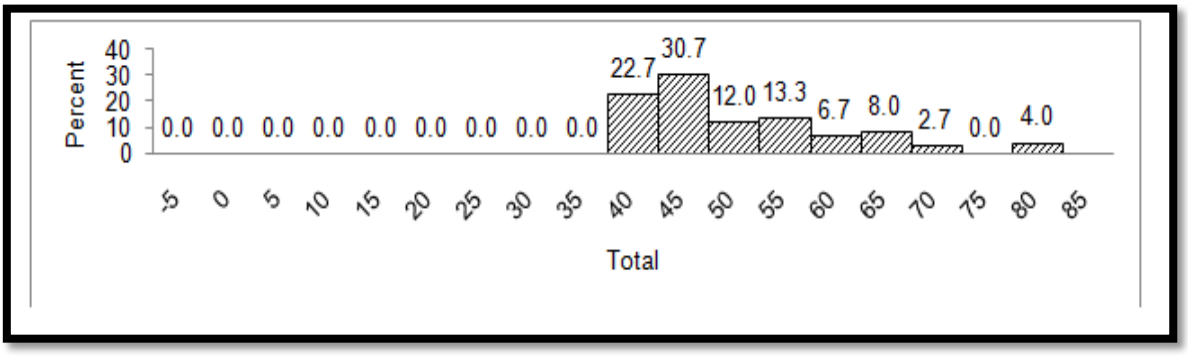

Figure 20: Histogram showing results for Overall Scores for 1to less than 75th rank Management Institutions

VII. CONCLUSIONS

1) The Karl Pearson correlation coefficients between Total Score and different parameters included in NIRF are shown below in Table 3.Total score and all parameter scores belong to continuous data .According to (Black, Descriptive Statistics, 2009) all values greater than 0.8 show strong positive correlation ,between 0.5 to 0.8 show moderate positive correlation and less than 0.5 show weak positive correlation .Similarly all values less than -0.8 show strong negative correlation ,between -0.5 to -0.8 show moderate negative correlation and less than -0.5 show weak negative correlation.

Table 3: Product Moment Correlation between different NIRF Parameters and Total Score

	SS	FSR	FQE	FRU	GPH	PU	QP	FPPP	GUE
Total Score	0.408	0.085	0.422	0.619	0.329	0.719	0.697	0.755	0.090
	MS	RD	WD	ESCS	PCS	PR			
Total Score	0.805	0.505	-0.342	0.150	-0.202	0.873			

2) The Spearman rank correlation coefficients between total score rank and ranks of all institutions in different parameter based on their scores are shown below in Table 4 .According to (Black, Descriptive Statistics, 2009) this coefficient is based on ordinal data.

Table 4: Spearman Correlation Coefficient between different NIRF Parameters and Total Score

	SS	FSR	FQE	FRU	GPH	PU	QP	FPPP	GUE
Total Score	0.288	0.124	0.462	0.525	0.368	0.690	0.691	0.607	0.325
	MS	RD	WD	ESCS	PCS	PR			
Total Score	0.788	0.567	-0.453	0.254	0.180	0.774			

3) The skewness values which show the deviation from normal distribution curves for all parameters are shown below in Table 5 .According to **(Black, Descriptive Statistics,**

2009) skewness values help us understand the relationship between mean, median and mode. The mean is always towards the tail of the distribution**.**

Table 5: Skewness values for all NIRF Parameters and Total Score

Total Score	SS	FSR	FQE	FRU	GPH	PU	QP	FPPP	GUE
1.275	-0.194	-1.722	-0.400	-0.701	-1.625	1.150	0.786	1.229	-4.538
MS	RD	WD	ESCS	PCS	PR				
0.143	-1.043	-0.685	2.548	-4.44	1.715				

4) The Chi Square Goodness of Fit Test was applied to check the hypothesis that top quality Management institutions are uniformly spread across the 36 (states and union territories) of India and Chi Square Observed was 124.20 which was greater than the Chi Square Critical value of 49.765 at 0.05 level of significance and p value 6.52*10 -12 which is less than 0.05 so null hypothesis was rejected and alternate was accepted. As alternate hypothesis was accepted so it was concluded that top Quality Management Institutions are not uniformly present in all 36 (states and union territories) of India and hence it is a failure of implemented policies as concerned departments have failed in their target of providing access to top quality Management Education in all states.

5) The regression analysis for the total score as dependent variable and various parameters as independent variables states that 99.94% of the variation is contributed by the parameters involved out of which 99.93% of variation is explainable as shown in Table 6. The beta coefficients are all significant at 5% level of significance as p value is less than 0.05 for all as shown in Table 8. The Table 7 which is the ANOVA table shows that the significance F value is less than 0.05 and hence atleast one of the beta coefficients among independent variables is having a significant value and is not equal to 0.

Table 6: Explanation Power through R square

Regression Statistics	
Multiple R	0.999719778
R Square	0.999439634
Adjusted R Square	0.999297168
Standard Error	0.265203469
Observations	75

Table 7: Anova Table

	df	*SS*	*MS*	*F*	*Significance F*
Regression	15	7401.080355	493.405357	4.93744E-90	
Residual	59	4.149639906	0.07033288		
Total	74	7405.229995			

Table 8: Beta coefficients for all independent variables and p values showing their significance

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	-0.050294505	0.848741764	-0.059257723	**0.952947092**
SS	0.053224965	0.002062189	25.80993521	**7.76135E-34**
FSR	0.089308377	0.004992837	17.88729989	**1.66687E-25**
FQE	0.061640592	0.004847172	12.71681458	**1.50179E-18**
FRU	0.085796252	0.002953817	29.04589109	**1.20496E-36**
PU	0.116927269	0.005024827	23.26990862	**2.04457E-31**
QP	0.120514124	0.004316822	27.91732826	**1.0682E-35**
FPPP	0.065487813	0.003676592	17.81209614	**2.05714E-25**
GPH	0.082216132	0.002769462	29.68668177	**3.60626E-37**
GUE	0.043287271	0.006481767	6.678313795	**9.457E-09**
MS	0.07861833	0.004216498	18.64541093	**2.0682E-26**
RD	0.029727471	0.001946092	15.27547208	**3.61635E-22**
WD	0.030429471	0.002910219	10.45607756	**4.71004E-15**
ESCS	0.015533021	0.005363866	2.895862733	**0.005295433**
PCS	0.021116207	0.003291572	6.415234273	**2.62045E-08**
PR	0.103199715	0.0027874	37.02365385	**1.52571E-42**

The multi-collinearity check was done to find out whether there was any multi-colinearity between variables for which each independent variable was regressed against other independent variables as dependent variable and the Table 9 was formed for Tolerance and Variance Inflation Factor readings. The VIF value greater than 10 is not acceptable according to (Nayak J. K.) and VIF less than 5 is preferable .Hence a better model was obtained after removal of one of the 2 variables showing high VIF. After removal of QP the R square is reduced to 99.20 and after removal of PU the R square is reduced to 99.43 .The correlation between QP and PU initially in the correlation matrix was 0.935 .After removal of QP and PU one after the other there is no VIF reading greater than 10 which shows the elimination of multi-collinearity. On removal of QP the VIF for MS is reduced from 5.65 to 5.53 but the VIF remains same as 5.65 on removal of PU. Hence, removal of QP is a better option and the new regression model is formulated after its removal.

Table 9: Tolerance and Variance Inflation Factor values for all independent variables initially and after removal of variables having high VIF

	SS	**FSR**	**FQE**	**FRU**	**GPH**	**PU**	**QP**	**FPPP**	**GUE**
Tolerance	0.553	0.430	0.443	0.356	0.416	**0.0881**	**0.097**	0.272	0.578
VIF	1.807	2.323	2.259	2.811	2.401	**11.35**	**10.331**	3.682	1.729
Tolerance (PU Removed)	0.588	0.431	0.451	0.356	0.419	Removed	0.340	0.273	0.579
VIF (PU Removed)	1.702	2.321	2.219	2.806	2.388	Removed	2.940	3.667	1.726
Tolerance (QP Removed)	0.605	0.436	0.447	0.357	0.423	0.310	Removed	0.274	0.581
VIF (QP Removed)	1.651	2.293	2.237	2.802	2.366	3.230	Removed	3.643	1.719
	MS	**RD**	**WD**	**ESCS**	**PCS**	**PR**			
Tolerance	**0.177**	0.425	0.517	0.657	0.713	0.230			
VIF	**5.657**	2.354	1.933	1.522	1.402	4.338			
Tolerance (PU Removed)	**0.177**	0.427	0.520	0.662	0.720	0.250			
VIF (PU Removed)	**5.657**	2.340	1.924	1.510	1.388	4.000			
Tolerance (QP Removed)	**0.180**	0.428	0.518	0.676	0.423	0.231			
VIF (QP Removed)	**5.536**	2.334	1.931	1.478	2.366	4.326			

6) Using the regression model after removal of QP the total score formula is computed which is shown below-

   Total Score = 3.913 + 0.351*SS + 0.245*FSR + 0.242*FQE + 0.271*FRU+ 0.589*PU + 0.275*FPPP + 0.182*GPH + 0.146*GUE + 0.240*MS + 0.116*RD + 0.094*WD + 0.204*ESCS + 0.114*PCS + 0.099*PR

   In the new regression model also beta coefficients of all independent variables are significant except GUE (Metric for University Examinations).

7) The median salary average for last 3 years varies from 23 lakhs to 5 lakhs for 1st to 75th ranked institution. Minimum Average Median salary offered is 10 lakhs from rank 1-20 ,5 lakhs from rank 21-40, 4 lakhs from rank 41-60 ,2 lakhs from 61-75 .

8) Out of the 16 parameters including total score, in 7 parameters more than 50% of the institutions score less than 50% marks .These 7 parameters are Combined metric for faculty with PHD and experience, Financial resources and their utilization, Combined metric for quality of publications, Footprints of projects, professional practice and executive development programmes, Economically and Socially Challenged Students (ESCS), Peer Perception: Employers & Academic Peer (PR) and Total Score.

9) It is strange to see that sector wise employer requirements recording and strategy formulation based on requirements is not stated in the NIRF Framework which shows lack of emphasis on Quality by Design during Skill Development during Management Programmes.

VIII. SCOPE OF FUTURE RESEARCH

1) It will be interesting to do the comparative analysis of NIRF 2020 ranked institutions and NIRF 2021 ranked and NIRF 2022 ranked institutions.

2) The comparative analysis of average Median Salary (MS) of the placed students and the fees of the respective institutions will help in understanding the return on investment in education of students.

3) It will be interesting to find out the reasons for the poor presence of NIRF Ranked institutions in World Rankings.

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