

Students' Perspective (Stream Wise) of Parameters Affecting the Undergraduate Engineering Education: A Live Study

Neeraj Kumari*, Deepak Kumar**

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Abstract

Purpose – The study aims to examine the students' perspective (stream wise) of parameters affecting the undergraduate engineering education system present in a private technical institution in NCR, Haryana, India.

Research design, data, and methodology – It is a descriptive type of research in nature. Questionnaire Based Survey has been used to collect the data. The sample size for the study is 500 comprising of the students respondents. The sample has been taken randomly and the questionnaire was filled by the students (pursuing B. Tech) chosen on the random basis from a private technical educational institution in NCR, Haryana, India. For data analysis and conclusion of the results of the survey, statistical tool like F test was performed with the help of high quality software; SPSS.

Conclusion – Analysis of variance revealed statistically no difference between the mean number of the groups (stream wise) for the parameters "Selection", "Academic Excellence", "Infrastructure", "Personality Development and Industry Exposure" and "Management and Administration". While Analysis of variance revealed statistically difference between the mean numbers of the groups for the parameter "Placements".

Keywords: Career, Higher Education, Management, Placement, Technical Education, Quality Education.

JEL classifications: M5, M00, M5.

1. Introduction

Higher education up to a great extent is responsible for social cohesion, cultural development, economic growth, equity and justice. Indian higher education system can address itself to the

global challenges through maintaining the appropriate balance between the two, i.e. the demand and the need and channelizing teaching, research and extension activities. The higher education system in today's scenario is faced with many challenges like competitiveness, management, financing and reorientation of program by laying equal emphasis on quality of higher education, ethics and values together with the assessment of educational institutions and their accreditation.

1.1. Implications for Higher Technical Education

Higher education institution can learn a great deal from the following ideas:

- Effective leadership and commitment of top management
- Conducive environment for learning and staff development
- Using latest technologies
- Participatory management
- Effective communication
- Competitive environment
- Culture of quality

2. Literature Review

Gafoor & Khabeer (2013) the study concluded that the ICT is the need of the hour for quality assurance in Higher Education as it fastens the process of assessment and audit with greater transparency. ICT can be used in assessing the quality of education in Colleges of the University.

Bairagi & Shrivastava (2013) the study concluded that starting from the period around the freedom struggle, there has been a consistent demand for FCE. However, in order to maintain uniform standards across India and to create a 'common language', it is imperative to enact skeletal Central-level legislation in such a manner that it allows room for local need based innovations.

Sindhvani & Kumar (2013) the study concluded that people across the globe are looking towards the system of education to infuse human values among the students so that the world remains as a place of peace, security and prosperity.

Deb (2012) the study concluded that regulation of higher education in India should be achieved through the correct approach

* Corresponding Author, Dr., Assistant Professor, FET, Manav Rachna International University, Faridabad, Haryana, India. Email: neerajnarwat@gmail.com

** Associate Professor, Dr., FET, Manav Rachna International University, Faridabad, Haryana, India.

in facilitating the attainment of high quality through interaction of the profit motives of various providers- private, domestic as well as foreign. In short, considering rather than defensive approach is required to benefit from the liberalization of higher education services.

Mukherjee (2012) the study concluded that in the context of Indian politics in the post reform period, it may be fruitfully employed in studying phenomena such as the rise of vernacular elites, judicialization of politics and emerging forms of identity politics.

Abhilash & Mohankumar (2012) the study concluded that courses like research methodology, scientific innovations and intellectual property rights should be an essential part in post graduate curriculum to encourage the students to take up research as a profession. Faculty involved in research should be given ample opportunity to boost their confidence level to compete internationally and they should be recognized or encouraged for their research contributions.

Kapur (2010) the study concluded that the success of the evolving surrogate education system has (at least now) depended mainly on drastic selection mechanisms and the ability to pay private providers. But for the vast majority of graduates with worthless degrees, who are not selected into these training programs, the risk of being locked into low productivity occupations is very real.

Sharma & Tewari (2010) the study concluded that Concurrent Engineering has been able to find the place in top ten best practices in academics. Because of the rapid changes in technology and uncertainty, we need to take care of the extent to which activities are to be done simultaneously or sequentially.

Dukkipati (2010) the study concluded that for India to maintain its economic growth in a global market place fuelled by the knowledge economy, it needs to nearly double its number of students in higher education by 2012. Without proper access to education the country's demographic dividend could turn into a demographic disaster.

3. Research Methodology

3.1. Objective of the study

To examine the students' perspective (stream wise) of parameters affecting the undergraduate engineering education system present in a private technical institution in NCR, Haryana, India.

3.2. Sampling

The research is a descriptive type of research in nature. Questionnaire Based Survey has been used to collect the data. The sample size for the study is 500 comprising of the students respondents. The sample has been taken randomly and the questionnaire was filled by the students (pursuing B. Tech) chosen on the random basis from a private technical educational institution in NCR, Haryana, India.

3.3. Database collection

The primary data was collected through questionnaire and personal interview method from the private technical institute chosen randomly. And the secondary data was gathered through the study of studies and research work carried out in the past.

3.4. Scope of the study

The area for the study is National Capital Region (NCR) and the institution to be studied is a private technical educational institution in NCR. The respondents are the students pursuing B. Tech who were selected randomly from the above said geographical area.

3.5. Statistical tools to be used

For data analysis and conclusion of the results of the survey, statistical tool like F test was performed on the high quality software; SPSS.

4. Data Analysis and Interpretations

4.1. Applying F test (one way ANOVA) on the sample

<Table 1> Showing the descriptive with reference to "stream" of the sample.

		Descriptives							
		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Selection	Electronics & Communication	38	16.39	3.803	.617	15.14	17.64	11	23
	Computer Science	251	14.75	3.416	.216	14.32	15.17	6	27
	Information Technology	44	14.32	2.955	.446	13.42	15.22	10	24
	Mechanical	134	15.41	4.148	.358	14.70	16.12	6	27
	Automobile	20	14.55	3.748	.838	12.80	16.30	6	21
	Aeronautical	6	15.00	4.290	1.751	10.50	19.50	8	19
	Bio Technology	7	16.14	3.805	1.438	12.62	19.66	11	22
	Total	500	15.03	3.666	.164	14.71	15.35	6	27

Descriptives									
		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Academic Excellence	Electronics & Communication	38	37.74	7.893	1.280	35.14	40.33	24	59
	Computer Science	251	36.39	8.698	.549	35.31	37.47	15	64
	Information Technology	44	36.23	6.723	1.014	34.18	38.27	21	51
	Mechanical	134	36.80	8.673	.749	35.32	38.28	15	62
	Automobile	20	37.15	7.485	1.674	33.65	40.65	15	49
	Aeronautical	6	42.50	16.429	6.707	25.26	59.74	18	59
	Bio Technology	7	37.29	9.411	3.557	28.58	45.99	27	52
	Total	500	36.70	8.540	.382	35.95	37.45	15	64
Infrastructure	Electronics & Communication	38	75.08	15.109	2.451	70.11	80.05	40	106
	Computer Science	251	75.25	16.964	1.071	73.15	77.36	32	125
	Information Technology	44	76.64	13.529	2.040	72.52	80.75	48	107
	Mechanical	134	79.04	19.131	1.653	75.77	82.31	32	133
	Automobile	20	78.55	14.855	3.322	71.60	85.50	32	106
	Aeronautical	6	81.67	33.506	13.679	46.50	116.83	42	139
	Bio Technology	7	71.86	13.729	5.189	59.16	84.55	49	88
	Total	500	76.54	17.315	.774	75.02	78.06	32	139
Personality Development And Industry Exposure	Electronics & Communication	38	37.21	8.435	1.368	34.44	39.98	14	52
	Computer Science	251	35.98	9.134	.577	34.84	37.11	14	64
	Information Technology	44	37.82	8.748	1.319	35.16	40.48	18	58
	Mechanical	134	37.25	10.690	.923	35.43	39.08	14	70
	Automobile	20	36.45	9.589	2.144	31.96	40.94	14	56
	Aeronautical	6	37.17	15.562	6.353	20.84	53.50	15	63
	Bio Technology	7	33.43	10.309	3.897	23.89	42.96	19	47
	Total	500	36.57	9.589	.429	35.73	37.41	14	70
Placements	Electronics & Communication	38	17.18	5.651	.917	15.33	19.04	6	29
	Computer Science	251	13.83	4.058	.256	13.32	14.33	6	29
	Information Technology	44	14.20	4.465	.673	12.85	15.56	6	25
	Mechanical	134	15.22	5.305	.458	14.31	16.12	6	30
	Automobile	20	15.35	5.622	1.257	12.72	17.98	6	26
	Aeronautical	6	18.00	7.694	3.141	9.93	26.07	8	30
	Bio Technology	7	18.14	5.669	2.143	12.90	23.39	8	25
	Total	500	14.66	4.825	.216	14.24	15.08	6	30
Management And Administration	Electronics & Communication	38	28.21	7.771	1.261	25.66	30.76	11	44
	Computer Science	251	27.22	6.840	.432	26.37	28.07	11	50
	Information Technology	44	29.50	8.088	1.219	27.04	31.96	11	48
	Mechanical	134	27.15	7.266	.628	25.91	28.39	11	51
	Automobile	20	28.35	6.089	1.362	25.50	31.20	15	38
	Aeronautical	6	28.50	10.986	4.485	16.97	40.03	11	43
	Bio Technology	7	29.14	8.133	3.074	21.62	36.66	12	37
	Total	500	27.56	7.182	.321	26.93	28.20	11	51

Interpretations: The numbers of respondents from various streams are as follows: Electronics & Communication (38), Computer Science (251), Information Technology (44), Mechanical (134), Automobile (20), Aeronautical (6), and Bio Technology (7).

<Table 2> Showing the test of homogeneity of variances of the sample.

Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
Selection	2.240	6	493	.038
Academic Excellence	2.601	6	493	.017
Infrastructure	2.174	6	493	.044
Personality Development And Industry Exposure	1.051	6	493	.391
Placements	3.679	6	493	.001
Management And Administration	.651	6	493	.689

Interpretations: The Test of Homogeneity of Variances output tests the null hypothesis:

H0: σ^2 Electronics & Communication = σ^2 Computer Science = σ^2 Information Technology = σ^2 Mechanical = σ^2 Automobile = σ^2 Aeronautical = σ^2 Bio Technology

1. Selection: The p value is 0.038. Because the p value is smaller than the α level, we reject H0 implying that there is little evidence that the variances are equal and the homogeneity of variance assumption may not be satisfied.

2. Academic Excellence: The p value is 0.017. Because the

p value is smaller than the α level, we reject H0 implying that there is little evidence that the variances are equal and the homogeneity of variance assumption may not be satisfied.

3. Infrastructure: The p value is 0.044. Because the p value is smaller than the α level, we reject H0 implying that there is little evidence that the variances are equal and the homogeneity of variance assumption may not be satisfied.

4. Personality Development and Industry Exposure: The p value is 0.391. Because the p value is greater than the α level, we fail to reject H0 implying that there is little evidence that the variances are not equal and the homogeneity of variance assumption may be reasonably satisfied.

5. Placements: The p value is 0.001. Because the p value is smaller than the α level, we reject H0 implying that there is little evidence that the variances are equal and the homogeneity of variance assumption may not be satisfied.

6. Management and Administration: The p value is 0.689. Because the p value is greater than the α level, we fail to reject H0 implying that there is little evidence that the variances are not equal and the homogeneity of variance assumption may be reasonably satisfied.

<Table 3> Showing the ANOVA statistics of the sample.

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Selection	Between Groups	145.564	6	24.261	1.823	.093
	Within Groups	6562.044	493	13.310		
	Total	6707.608	499			
Academic Excellence	Between Groups	284.321	6	47.387	.647	.693
	Within Groups	36111.871	493	73.249		
	Total	36396.192	499			
Infrastructure	Between Groups	1723.698	6	287.283	.958	.453
	Within Groups	147874.580	493	299.948		
	Total	149598.278	499			
Personality Development And Industry Exposure	Between Groups	306.819	6	51.137	.553	.768
	Within Groups	45573.589	493	92.441		
	Total	45880.408	499			
Placements	Between Groups	627.566	6	104.594	4.693	.000
	Within Groups	10988.634	493	22.289		
	Total	11616.200	499			
Management And Administration	Between Groups	268.766	6	44.794	.867	.519
	Within Groups	25468.186	493	51.660		
	Total	25736.952	499			

Interpretations: Following are the null and the alternate hypothesis:

H0: μ Electronics & Communication = μ Computer Science = μ Information Technology = μ Mechanical = μ Automobile = μ Aeronautical = μ Bio Technology

Ha: not H0

Where μ represents the mean number of group

1. Selection: The p value is 0.093 which is greater than the α level, so we fail to reject H0. That is, there is insufficient evidence to claim that some of the means may be different from each other. Thus, analysis of variance revealed statistically no difference between the mean number of the groups, where $F(6, 493) = 1.823$, $p = 0.093$, $M\text{ Error} = 13.310$, $\alpha = 0.05$. The 6 is the between-groups degrees of freedom, 493 is the within-groups degrees of freedom, 1.823 is the F ratio from the F column, 0.093 is the value in the Sig. column (the p value), and 13.310 is the within-groups mean square estimate of variance.

2. Academic Excellence: The p value is 0.693 which is greater than the α level, so we fail to reject H0. That is, there is insufficient evidence to claim that some of the means may be different from each other. Thus, analysis of variance revealed statistically no difference between the mean number of the groups, where $F(6, 493) = 0.647$, $p = 0.693$, $M\text{ Error} = 73.249$, $\alpha = 0.05$. The 6 is the between-groups degrees of freedom, 493 is the within-groups degrees of freedom, 0.647 is the F ratio from the F column, 0.693 is the value in the Sig. column (the p value), and 73.249 is the within-groups mean square estimate of variance.

3. Infrastructure: The p value is 0.453 which is greater than the α level, so we fail to reject H0. That is, there is insufficient evidence to claim that some of the means may be different from each other. Thus, analysis of variance revealed statistically no difference between the mean number of the groups, where $F(6, 493) = 0.958$, $p = 0.453$, $M\text{ Error} = 299.948$, $\alpha = 0.05$. The 6 is the between-groups degrees of freedom, 493 is the within-groups degrees of freedom, 0.958 is the F ratio from the F column, 0.453 is the value in the Sig. column (the p value), and 299.948 is the within-groups mean square estimate of variance.

4. Personality Development and Industry Exposure: The p value is 0.768 which is greater than the α level, so we fail to reject H0. That is, there is insufficient evidence to claim that some of the means may be different from each other. Thus, analysis of variance revealed statistically no difference between the mean number of the groups, where $F(6, 493) = 0.553$, $p = 0.768$, $M\text{ Error} = 92.441$, $\alpha = 0.05$. The 6 is the between-groups degrees of freedom, 493 is the within-groups degrees of freedom, 0.553 is the F ratio from the F column, 0.768 is the value in the Sig. column (the p value), and 92.441 is the within-groups mean square estimate of variance.

5. Placements: The p value is 0.000 which is smaller than the α level, so we reject H0. That is, there is sufficient evidence to claim that some of the means may be different from each other. Thus, analysis of variance revealed statistically difference between the mean number of the groups, where $F(6, 493) = 4.693$, $p = 0.000$, $M\text{ Error} = 22.289$, $\alpha = 0.05$. The 6 is

the between-groups degrees of freedom, 493 is the within-groups degrees of freedom, 4.693 is the F ratio from the F column, 0.000 is the value in the Sig. column (the p value), and 22.289 is the within-groups mean square estimate of variance.

6. Management and Administration: The p value is 0.519 which is greater than the α level, so we fail to reject H0. That is, there is insufficient evidence to claim that some of the means may be different from each other. Thus, analysis of variance revealed statistically no difference between the mean number of the groups, where $F(6, 493) = 0.867$, $p = 0.519$, $M\text{ Error} = 51.660$, $\alpha = 0.05$. The 6 is the between-groups degrees of freedom, 493 is the within-groups degrees of freedom, 0.867 is the F ratio from the F column, 0.519 is the value in the Sig. column (the p value), and 51.660 is the within-groups mean square estimate of variance.

5. Conclusions

The numbers of respondents from various streams are as follows: Electronics & Communication (38), Computer Science (251), Information Technology (44), Mechanical (134), Automobile (20), Aeronautical (6), and Bio Technology (7).

There is little evidence that the variances are equal and the homogeneity of variance assumption may not be satisfied for the parameters "Selection", "Academic Excellence", "Infrastructure" and "Placements". While there is little evidence that the variances are not equal and the homogeneity of variance assumption may be reasonably satisfied for the parameters "Personality Development and Industry Exposure" and "Management and Administration".

Analysis of variance revealed statistically no difference between the mean number of the groups (stream wise) for the parameters "Selection", "Academic Excellence", "Infrastructure", "Personality Development and Industry Exposure" and "Management and Administration". While Analysis of variance revealed statistically difference between the mean number of the groups for the parameter "Placements".

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