STUDENTS' PERSPECTIVE (AGE WISE, GENDER WISE AND YEAR WISE) OF PARAMETERS AFFECTING THE UNDERGRADUATE ENGINEERING EDUCATION

By

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ABSTRACT

The objective of the study is to examine the students' perspective (age wise, gender wise and year wise) of parameters affecting the undergraduate engineering education system present in a private technical institution in NCR, Haryana. It is a descriptive type of research in nature. The data has been collected with the help of a structured questionnaire based on the Likert scale. The sample size for the study is 500. The sample has been taken on the random (Probability) basis 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. For data analysis and conclusion of the results of the survey, statistical tool like t test was performed with the help of high quality software; 'SPSS'. To conclude t test revealed statistically no difference between the mean number of two groups (age wise) for the parameters "Selection", "Academic Excellence" and "Management and Administration".Also t test revealed statistically no difference between the mean number of two groups (gender wise) for the parameters "Selection", "Academic Excellence", Infrastructure", "Personality Development and Industry Exposure", "Placements" and "Management and Administration".The t test revealed statistically no difference between the mean number of two groups (year wise) for the parameters "Selection", "Academic Excellence", "Personality Development and Industry Exposure", "Placements" and "Management and Administration". While t test revealed a statistically reliable difference between the mean number of two groups (age wise) for the parameters "Infrastructure", "Personality Development and Industry Exposure" and "Placements". t test revealed a statistically reliable difference between the mean number of two groups (year wise) for the parameter "Infrastructure".

Keywords: Academic, Higher Education, Infrastructure, Industry Exposure, Management, Placements, Personality Development, Private Technical, Technical Institution, Quality Education.

INTRODUCTION

Quality education is a package which means (a) conforming to comparable standards with innovative approach (b) fulfilling the academic intellectual requirements with optimal degree of excellence (c) adequate capability to consistently cope with the demands of the world of work & scope for employability (d) development of innate qualities to optimum level (e) satisfying the stake holders as per social expectation.

To ensure quality every institution should have a road map of its own. This road map must contain vision and mission statement, quality of policy details, and programmes of action supported by constant review and monitoring. To ensure quality every higher education institution should have sufficient infrastructure, learning resources, academic environment, competent dedicated teaching faculties with due, status, need based curriculum design and planning with diversity and flexibility. There must also be provision of appropriate teaching learning experience, use of technology and provision of facilities to promote research or extension related activities.

Higher education will become both repository and creator of knowledge. It will become the driving force of economic development and local point at learning in the society. Due to liberalization and privatization in education sector the nonqualified institution will automatically die down. University no longer will have the

monopoly of higher learning. National system of higher education will become varied and complex. Besides, a large number of satellite institutions will come up to supplement the needs for higher education.

Implications for Higher Technical Education

Deming, Juran and Crosby may be given the credit of developing the vocabulary on quality management. All three concentrated on quality in the manufacturing, but their contribution can be applied to education sector including education. Higher education institution can learn a great deal from these ideas. It can summarize a few points as follows,

- Leadership and commitment of top management plays a significant role in quality improvement.
- Creating an environment for learning and staff development is crucial to do task right every time.
- Adopt new philosophies and technologies that can improve the quality.
- Encourage teamwork and participatory management.
- Develop a communication strategy to report progress and results.
- Recognize the efforts of staff without creating a competitive environment.
- Put appropriate systems and processes in place as per the needs of the stakeholders.
- Encourage quality circles and a culture of quality.

Literature Review

Himani Sharma and Virendra K. Goswami (2013) present the study, as an effort has been made to analyze the role of FDI qualitatively for sustenance of Quality in Higher Education in India and all over the globe. The author has used the descriptive method as well as analytical, based on the analysis of secondary data. The study concluded that FDI will be an important tool for development quality and its sustenance in the realm of higher education, particularly for the developing and the poor nations as well as the developed states all over the globe. FDI also brings international cooperation, develop friendship between two nations and in nutshell brings peace to the humanity.

Dharini S, Deepa Mohan and Sudarsan N (2013) the study attempt to aggregate the academic ambience prevailing in a case institution of higher education with an aim to identify the areas of shortcomings that can aid the management to focus their efforts on improvising the ambience. The author has collected data through a survey questionnaire from the students of second and third year of various streams of a reputed higher educational institution in southern part of India. The total sample of 165 respondents were selected with the help of random sampling technique. The analysis has been done with the help of frequency distribution tables and bar charts. The study concluded that the current investigation is a part of other major expectations in the field of higher education in India. The experience throughout the current investigation and competitions had been accelerating and providing insights into the perceptions of students undergoing higher education in an institution of repute.

Melissa Helen (2013)'s study concluded that there is a direct need for not only training the students in soft skills but also enabling the trainees to be professionally trained. This will ensure the effectiveness and success of any training program. The management as well as the trainers and trainees would benefit if the organization send the trainers for training which is imperative for teachers in their mid-career, whose services are required to handle such courses in soft skills/personality development.

Uma Kanjilal (2013)'s case study provides an insight into the process of eGyanKosh evolving from a digital repository to an OER repository. The study concluded that adoption of an OER policy will give further impetus to the university to evolve as a system leader on the ODL front. The concept of OER is very new to the country and is at a nascent stage of development. IGNOU will have to play a major role in building awareness about OER, and possibly help other ODL institutions in the country to adopt OER policies.

K.G. Durga Prasad, K. Venkata Subbaiah and G. Padmavathi (2012)'s study demonstrates the novel application of six sigma approach for improving the

quality in an Engineering Educational institution by eliminating the failure causes. The tool used in the study is Six sigma five phase methodology that is DMAIC (Define - Measure - Analyze - Improve - Control) adopted to establish a novel approach with a view to improve quality in an engineering educational institution. Critical To Quality (CTQ) flow down is established and SIPOC (Supplier - Input- Process- Output - Customer) chart is constructed in the Define phase of the methodology. Process capability indices are calculated in the Measure phase. In the Analyze phase, Fish bone diagram is established to identify various causes and Pareto diagram is constructed to arrange the problems in the order of importance. Failure mode effect analysis is carried out in the Improvement phase to anticipate the possible types of failures. In the Control phase, Control charts help to monitor the people involved in the processes of engineering education system. A study is presented in the study to demonstrate the methodology. The study concluded that six sigma is a powerful tool to achieve customer satisfaction by improving the processes in any system, which may be production or service sector.

Priya Matta and Neelam Singh (2012)'s study focuses towards an approach and a methodological model that can enhance and assure quality in an e-learning environment. It also introduced the recognition of various quality metrics for e-learning environment in association with knowledge management. A methodological model for e-learning in association with quality assurance and enhancement is proposed for semi-dynamic and deterministic environment. Quality assurance and enhancement is used as an iterative process integrated with each module of the model. The study concluded that e-learning plays an important and vital role in day to day life, as well as in information world. There is no field, or industry that remained untouched from the effects of advancement in e-learning. In near future it will have its influence on each and every aspect of human life.

L. Santhi and N. Radhakrishnan (2012) 's study concluded that it has been observed that most of the researchers are satisfied with E-resources available in their institutions. Some of the research scholars felt that they need orientation to use them and most of them are not aware of open access e-resources.

Susmita Chakraborty and S.B. Ghosh (2011)'s study introduces the merits of Open Access resources especially in a developing country scenario. It delineates the different problems of the Indian LIS professionals in the provision of higher education resources. It describes the key players in the creation of open scholarly archives. The study focus on the exploration of University Grants Commission norms related to submission of electronic thesis and dissertation & norms of ' Digital Library of India'. The study concluded that India has started in the OER way. Contributions made by Distance Learning Universities (Open Universities) are major creator in the field of Open Resources. Government initiatives in the form of the contributions provided by INFLIBNET and NIC (National Informatics Centre) have helped the stakeholders of the Higher education community.

I Sasireka, S Gopalakrishnan and S Balamurugan (2011)'s study describes about the availability of electronic resources in academic libraries in Tamil Nadu. The study provides evidence of the current status of e-resources, selection and access to various e- resources. The study was based on questionnaire method. A total of 275 questionnaires were distributed among the library professionals all over Tamil Nadu, of which 205 filled in questionnaire were received with a response rate of (74.5). The scope of the study is confined to the librarians of the private engineering colleges in Tamil Nadu. The study concluded that out of 205 engineering institutions, 145 (70.7%) colleges are providing access to electronic resources. Majority of the Non Minority Self Financing Institutions are providing e-resources facility. All Private Universities have good collections of electronic resources in their library.

Andreas Blom Hiroshi Saeki (2011)'s study emphasis that skill shortage remains one of the major constraints to continued growth of the Indian economy. The study concluded that engineering education institutions should seek to improve the skill set of graduates; recognize the importance of Soft Skills, refocus the assessments, teaching-learning process, and curricula away from

lower-order thinking skills, such as remembering and understanding, toward higher-order skills, such as analyzing and solving engineering problems, as well as creativity; and interact more with employers to understand the particular demand for skills in that region and sector.

Research Methodology

Objective of the Study

The objective of the study is to examine the students' perspective (age wise, gender wise and year wise) of parameters affecting the undergraduate engineering education system present in a private technical institution in NCR, Haryana.

Sampling: The research is a descriptive type of research in nature. The data has been collected with the help of Questionnaire Based Survey. The sample size for the study is 500 comprising of the students respondents. The sample has been taken on the random (Probability) basis 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.

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

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.

Group Statistics

	Age	N	Mean	Std. Deviation	Std. Error Mean
Selection	Up to 20 years	272	15.18	3.745	.227
	Above 20 years	228	14.85	3.570	.236
Academic Excellence	Up to 20 years	272	36.81	8.767	.532
	Above 20 years	228	36.57	8.280	.548
Infrastructure	Up to 20 years	272	78.82	18.571	1.126
	Above 20 years	228	73.81	15.282	1.012
Personality Development And Industry Exposure	Up to 20 years	272	37.62	10.063	.610
	Above 20 years	228	35.32	8.851	.586
Placements	Up to 20 years	272	15.05	4.757	.288
	Above 20 years	228	14.19	4.874	.323
Management And Administration	Up to 20 years	272	27.67	7.138	.433
	Above 20 years	228	27.44	7.247	.480

Table 1. Showing the group statistics with reference to "age" of the sample.

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Selection	Equal variances assumed	.053	.818	1.014	498	.311	.334	.329	-.313	.980
	Equal variances not assumed			1.018	489.801	.309	.334	.328	-.310	.978
Academic Excellence	Equal variances assumed	.088	.767	.310	498	.757	.238	.768	-1.270	1.746
	Equal variances not assumed			.312	490.943	.756	.238	.764	-1.263	1.738
Infrastructure	Equal variances assumed	5.729	.017	3.255	498	.001	5.012	1.540	1.986	8.038
	Equal variances not assumed			3.310	497.838	.001	5.012	1.514	2.037	7.987
Personality Development And Industry Exposure	Equal variances assumed	1.828	.177	2.689	498	.007	2.301	.856	.620	3.982
	Equal variances not assumed			2.720	496.831	.007	2.301	.846	.639	3.963
Placements	Equal variances assumed	.020	.886	1.987	498	.047	.858	.432	.010	1.707
	Equal variances not assumed			1.983	478.656	.048	.858	.433	.008	1.709
Management And Administration	Equal variances assumed	.928	.336	.357	498	.721	.231	.645	-1.038	1.499
	Equal variances not assumed			.357	480.274	.721	.231	.646	-1.039	1.500

INTERPRETATIONS: Following are the null and alternative hypotheses:
H_0: μ of group 1 = μ of group 2
H_a: μ of group 1 ≠ μ of group 2

Table 2. Showing the independent samples test with reference to "age" of the sample.

Statistical Tools to be Used: For data analysis and conclusion of the results of the study, statistical tool t test was performed with the help of high quality software; SPSS.

Data Analysis and Interpretations

Applying T test on the Sample

Table 1 gives the descriptive statistics for each of the two groups (as defined by the age wise variable). The last column gives the standard error of the mean for each of the two groups.

Selection: There are 272 respondents in the group 1 having up to 20 years of age, and they have a mean of 15.18, with a standard deviation of 3.745. There are 228 respondents in the group 2 having above 20 years of age, and they have a mean of 14.85, with a standard deviation of 3.570.

Academic Excellence: There are 272 respondents in the group 1 having up to 20 years of age, and they have a mean of 36.81, with a standard deviation of 8.767. There are 228 respondents in the group 2 having above 20 years of age, and they have a mean of 36.57, with a standard deviation of 8.280.

Infrastructure: There are 272 respondents in the group 1 having up to 20 years of age, and they have a mean of 78.82, with a standard deviation of 18.571. There are 228 respondents in the group 2 having above 20 years of age, and they have a mean of 73.81, with a standard deviation of 15.282.

Personality Development and Industry Exposure: There are 272 respondents in the group 1 having up to 20 years of age, and they have a mean of 37.62, with a standard deviation of 10.063. There are 228 respondents in the group 2 having above 20 years of age, and they have a mean of 35.32, with a standard deviation of 8.851.

Placements: There are 272 respondents in the group 1 having up to 20 years of age, and they have a mean of 15.05, with a standard deviation of 4.757. There are 228 respondents in the group 2 having above 20 years of age, and they have a mean of 14.19, with a standard deviation of 4.874.

Management and Administration: There are 272 respondents in the group 1 having up to 20 years of age, and they have a mean of 27.67, with a standard deviation of 7.138. There are 228 respondents in the group 2 having above 20 years of age, and they have a mean of 27.44, with a standard deviation of 7.247.

Where μ is the mean number of group

Table 2 shows the independent samples test with reference to "age" of the sample.

Selection: The inferential statistics gives the significance (p value) of Levene's test which is 0.818. As 0.818 is larger than α (usually 0.05).Hence, accept the null hypothesis and thus it can be assumed that the variances are equal and it would use the middle row of the output. Assuming equal variances, the t value is 1.014. There are 498 degrees of freedom. The two-tailed p value associated with the test 0.311. As before, the decision rule is given by: If $p \leq \alpha$, then reject H0. Here, 0.311 is more than to 0.05, so its clear to accept H0. That implies that it do not observe a difference in the mean number of the two groups.

Thus, t test revealed statistically no difference between the mean number of two groups, where group 1 has ($M = 15.18$, $s = 3.745$) and the group 2 has ($M = 14.85$, $s = 3.570$), $t(498) = 1.014$, $p = 0.311$, $\alpha = 0.05$.

Academic Excellence: The inferential statistics gives the significance (p value) of Levene's test which is 0.767. As 0.767 is larger than α (usually 0.05). Hence, accept the null hypothesis and thus it can be assumed that the variances are equal and it would use the middle row of the output. Assuming equal variances, the t value is 0.310. There are 498 degrees of freedom. The two-tailed p value associated with the test 0.757. As before, the decision rule is given by: If $p \leq \alpha$, then reject H0. Here, 0.757 is more than to 0.05, its clear to accept H0. That implies that it do not observe a difference in the mean number of the two groups.

Thus, t test revealed statistically no difference between the mean number of two groups, where group 1 has ($M = 36.81$, $s = 8.767$) and the group 2 has ($M = 36.57$, $s = 8.280$), $t(498) = 0.310$, $p = 0.757$, $\alpha = 0.05$.

Infrastructure: The inferential statistics gives the significance (p value) of Levene's test which is 0.017. As 0.017 is lesser than α (usually 0.05), we reject the null

hypothesis and thus it can be assumed that the variances are unequal and it would use the last row of the output. Assuming unequal variances, the t value is 3.310. There are 497 degrees of freedom. The two-tailed p value associated with the test is 0.001. As before, the decision rule is given by: If $p \leq \alpha$, then reject H0. Here, 0.001 is less than to 0.05, so its clear to reject H0. That implies that it observe a difference in the mean number of the two groups.

Thus, t test revealed a statistically reliable difference between the mean number of two groups, where group 1 has ($M = 78.82$, $s = 18.571$) and the group 2 has ($M = 73.81$, $s = 15.282$), $t(497) = 3.310$, $p = 0.001$, $\alpha = 0.05$.

Personality Development and Industry Exposure: The inferential statistics gives the significance (p value) of Levene's test which is 0.177. As 0.177 is larger than α (usually 0.05), hence accept the null hypothesis and thus it can be assumed that the variances are equal and it would use the middle row of the output. Assuming equal variances, the t value is 2.689. There are 498 degrees of freedom. The two-tailed p value associated with the test 0.007. As before, the decision rule is given by: If $p \leq \alpha$, then reject H0. Here, 0.007 is less than to 0.05, so its clear to reject H0. That implies that it observe a difference in the mean number of the two groups.

Thus, t test revealed a statistically reliable difference between the mean number of two groups, where group 1 has ($M = 37.62$, $s = 10.063$) and the group 2 has ($M = 35.32$, $s = 8.851$), $t(498) = 2.689$, $p = 0.007$, $\alpha = 0.05$.

Placements: The inferential statistics gives the significance (p value) of Levene's test which is 0.886. As 0.886 is larger than α (usually 0.05), hence accept the null hypothesis and thus it can be assumed that the variances are equal and it would use the middle row of the output. Assuming equal variances, the t value is 1.987. There are 498 degrees of freedom. The two-tailed p value associated with the test 0.047. As before, the decision rule is given by: If $p \leq \alpha$, then reject H0. Here, 0.047 is less than to 0.05, so its clear to reject H0. That implies that it observe a difference in the mean number of the two groups.

Thus, t test revealed a statistically reliable difference

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Selection	Male	378	15.00	3.749	.193
	Female	122	15.11	3.409	.309
Academic Excellence	Male	378	36.73	8.604	.443
	Female	122	36.61	8.373	.758
Infrastructure	Male	378	76.87	18.130	.933
	Female	122	75.50	14.519	1.314
Personality Development And Industry Exposure	Male	378	36.63	9.805	.504
	Female	122	36.40	8.924	.808
Placements	Male	378	14.59	5.007	.258
	Female	122	14.87	4.221	.382
Management And Administration	Male	378	27.56	7.633	.393
	Female	122	27.57	5.585	.506

Table 3. Showing the group statistics with reference to "gender" of the sample

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Selection	Equal variances assumed	2.574	.109	-.300	498	.764	-.115	.382	-.866	.636
	Equal variances not assumed			-.315	223.003	.753	-.115	.364	-.832	.602
Academic Excellence	Equal variances assumed	.541	.463	.133	498	.895	.118	.890	-1.631	1.867
	Equal variances not assumed			.134	209.722	.893	.118	.878	-1.612	1.848
Infrastructure	Equal variances assumed	5.902	.015	.761	498	.447	1.373	1.804	-2.171	4.917
	Equal variances not assumed			.852	252.879	.395	1.373	1.612	-1.801	4.547
Personality Development And Industry	Equal variances assumed	1.639	.201	.225	498	.822	.225	.999	-1.738	2.189
	Equal variances not assumed			.237	222.800	.813	.225	.952	-1.651	2.102
Placements	Equal variances assumed	7.731	.006	-.550	498	.583	-.276	.503	-1.264	.711
	Equal variances not assumed			-.599	239.993	.549	-.276	.461	-1.184	.632
Management And Administration	Equal variances assumed	8.984	.003	-.003	498	.998	-.002	.749	-1.473	1.469
	Equal variances not assumed			-.003	278.390	.997	-.002	.640	-1.262	1.258

INTERPRETATIONS: Following are the null and alternative hypotheses:

Table 4. Showing the independent samples test with reference to "gender" of the sample.

between the mean number of two groups, where group 1 has (M = 15.05, s = 4.757) and the group 2 has (M = 14.19, s = 4.874), t(498) = 1.987, p = 0.047, α = 0.05.

Management and Administration: The inferential statistics gives the significance (p value) of Levene's test which is 0.336. As 0.336 is larger than α (usually 0.05), hence accept the null hypothesis and thus it can be assumed that the variances are equal and it would use the middle row of the output. Assuming equal variances, the t value is 0.357. There are 498 degrees of freedom. The two-tailed p value associated with the test 0.721. As before, the decision rule is given by: If p ≤α, then reject H0. Here, 0.721 is more than to 0.05, so its clear to accept H0. That implies that it do not observe a difference in the mean number of the two groups.

Thus, t test revealed statistically no difference between the mean number of two groups, where group 1 has (M = 27.67, s = 7.138) and the group 2 has (M = 27.44, s = 7.247), t(498) = 0.357, p = 0.721, α = 0.05.

Table 3 gives the descriptive statistics for each of the two groups (as defined by the gender wise variable). The last column gives the standard error of the mean for each of the two groups.

Selection: There are 378 respondents in the group 1 comprising of male respondents, and they have a mean of 15.00, with a standard deviation of 3.749. There are 122 respondents in the group 2 comprising of female respondents, and they have a mean of 15.11, with a standard deviation of 3.409.

Academic Excellence: There are 378 respondents in the group 1 comprising of male respondents, and they have a mean of 36.73, with a standard deviation of 8.604. There are 122 respondents in the group 2 comprising of female respondents, and they have a mean of 36.61, with a standard deviation of 8.373.

Infrastructure: There are 378 respondents in the group 1 comprising of male respondents, and they have a mean of 76.87, with a standard deviation of 18.130. There are 122 respondents in the group 2 comprising of female respondents, and they have a mean of 75.50, with a standard deviation of 14.519.

Personality Development and Industry Exposure: There are 378 respondents in the group 1 comprising of male respondents, and they have a mean of 36.63, with a standard deviation of 9.805. There are 122 respondents in the group 2 comprising of female respondents, and they have a mean of 36.40, with a standard deviation of 8.924.

Placements: There are 378 respondents in the group 1 comprising of male respondents, and they have a mean of 14.59, with a standard deviation of 5.007. There are 122 respondents in the group 2 comprising of female respondents, and they have a mean of 14.87, with a standard deviation of 4.221.

Management and Administration: There are 378 respondents in the group 1 comprising of male respondents, and they have a mean of 27.56, with a standard deviation of 7.633. There are 122 respondents in the group 2 comprising of female respondents, and they have a mean of 27.57, with a standard deviation of 5.585.

H0: μ of group 1 = μ of group 2

Ha: μ of group 1 ≠ μ of group 2

Where μ is the mean number of group.

Table 4 shows the independent samples test with reference to "gender" of the sample.

Selection: The inferential statistics gives the significance (p value) of Levene's test which is 0.109. As 0.109 is larger than α (usually 0.05), hence accept the null hypothesis and thus it can be assumed that the variances are equal and it would use the middle row of the output. Assuming equal variances, the t value is 0.300. There are 498 degrees of freedom. The two-tailed p value associated with the test 0.764. As before, the decision rule is given by: If p ≤ α, then reject H0. Here, 0.764 is more than to 0.05, so its clear to accept H0. That implies that it do not observe a difference in the mean number of the two groups.

Thus, t test revealed statistically no difference between the mean number of two groups, where group 1 has (M = 15.00, s = 3.749) and the group 2 has (M = 15.11, s = 3.409), t(498) = 0.300, p = 0.764, α = 0.05.

Academic Excellence: The inferential statistics gives the significance (p value) of Levene's test which is 0.463. As 0.463 is larger than α (usually 0.05), hence accept the null

hypothesis and thus it can be assumed that the variances are equal and it would use the middle row of the output. Assuming equal variances, the t value is 0.133. There are 498 degrees of freedom. The two-tailed p value associated with the test 0.895. As before, the decision rule is given by: If $p \leq \alpha$, then reject H0. Here, 0.895 is more than to 0.05, so its clear to accept H0. That implies that we do not observe a difference in the mean number of the two groups.

Thus, t test revealed statistically no difference between the mean number of two groups, where group 1 has ($M = 36.73$, $s = 8.604$) and the group 2 has ($M = 36.61$, $s = 8.373$), $t(498) = 0.133$, $p = 0.895$, $\alpha = 0.05$.

Infrastructure: The inferential statistics gives the significance (p value) of Levene's test which is 0.015. As 0.015 is less than α (usually 0.05), hence, reject the null hypothesis and thus it can be assumed that the variances are unequal and it would use the last row of the output. Assuming unequal variances, the t value is 0.852. There are 252 degrees of freedom. The two-tailed p value associated with the test 0.395. As before, the decision rule is given by: If $p \leq \alpha$, then reject H0. Here, 0.395 is more than to 0.05, so its clear to accept H0. That implies that it do not observe a difference in the mean number of the two groups.

Thus, t test revealed statistically no difference between the mean number of two groups, where group 1 has ($M = 76.87$, $s = 18.130$) and the group 2 has ($M = 75.50$, $s = 14.519$), $t(252) = 0.852$, $p = 0.395$, $\alpha = 0.05$.

Personality Development and Industry Exposure: The inferential statistics gives the significance (p value) of Levene's test which is 0.201. As 0.201 is larger than α (usually 0.05), hence accept the null hypothesis and thus it can be assumed that the variances are equal and it would use the middle row of the output. Assuming equal variances, the t value is 0.225. There are 498 degrees of freedom. The two-tailed p value associated with the test 0.822. As before, the decision rule is given by: If $p \leq \alpha$, then reject H0. Here, 0.822 is more than to 0.05, so its clear accept H0. That implies that we do not observe a difference in the mean number of the two groups.

Thus, t test revealed statistically no difference between the mean number of two groups, where group 1 has ($M = 36.63$, $s = 9.805$) and the group 2 has ($M = 36.40$, $s = 8.924$), $t(498) = 0.225$, $p = 0.822$, $\alpha = 0.05$.

Placements: The inferential statistics gives the significance (p value) of Levene's test which is 0.006. As 0.006 is less than α (usually 0.05), hence reject the null hypothesis and thus it can be assumed that the variances are unequal and it would use the last row of the output. Assuming unequal variances, the t value is 0.599. There are 239 degrees of freedom. The two-tailed p value associated with the test 0.549. As before, the decision rule is given by: If $p \leq \alpha$, then reject H0. Here, 0.549 is more than to 0.05, so we accept H0. That implies that it do not observe a difference in the mean number of the two groups.

Thus, t test revealed statistically no difference between the mean number of two groups, where group 1 has ($M = 14.59$, $s = 5.007$) and the group 2 has ($M = 14.87$, $s = 4.221$), $t(239) = 0.599$, $p = 0.549$, $\alpha = 0.05$.

Management and Administration: The inferential statistics gives the significance (p value) of Levene's test which is 0.003. As 0.003 is less than α (usually 0.05), hence reject the null hypothesis and thus it can be assumed that the variances are unequal and it would use the last row of the output. Assuming unequal variances, the t value is 0.003. There are 278 degrees of freedom. The two-tailed p value associated with the test 0.997. As before, the decision rule

Group Statistics

	Year	N	Mean	Std. Deviation	Std. Error Mean
Selection	First or Second	238	15.13	3.728	.242
	Third or Fourth	262	14.94	3.614	.223
Academic Excellence	First or Second	238	36.88	8.735	.566
	Third or Fourth	262	36.55	8.373	.517
Infrastructure	First or Second	238	78.79	18.528	1.201
	Third or Fourth	262	74.49	15.894	.982
Personality Development And Industry Exposure	First or Second	238	37.26	10.088	.654
	Third or Fourth	262	35.95	9.086	.561
Placements	First or Second	238	14.82	4.808	.312
	Third or Fourth	262	14.51	4.845	.299
Management And Administration	First or Second	238	27.18	6.887	.446
	Third or Fourth	262	27.91	7.436	.459

Table 5. Showing the group statistics with reference to "year" of the sample.

is given by: If $p \leq \alpha$, then reject H0. Here, 0.997 is more than to 0.05, so its clear to accept H0. That implies that it do not observe a difference in the mean number of the two groups.

Thus, t test revealed statistically no difference between the mean number of two groups, where group 1 has ($M = 27.56$, $s = 7.633$) and the group 2 has ($M = 27.57$, $s = 5.585$), $t(278) = 0.003$, $p = 0.997$, $\alpha = 0.05$.

Table 5 gives the descriptive statistics for each of the two groups (as defined by the year wise variable). The last column gives the standard error of the mean for each of the two groups.

Selection: There are 238 respondents in the group 1 comprising of respondents from either first or second year, and they have a mean of 15.13, with a standard deviation of 3.728. There are 262 respondents in the group 2 comprising of respondents from either third or fourth year, and they have a mean of 14.94, with a standard deviation of 3.614.

Academic Excellence: There are 238 respondents in the group 1 comprising of respondents from either first or second year, and they have a mean of 36.88, with a standard deviation of 8.735. There are 262 respondents in the group 2 comprising of respondents from either third or fourth year, and they have a mean of 36.55, with a standard deviation of 8.373.

Infrastructure: There are 238 respondents in the group 1 comprising of respondents from either first or second year, and they have a mean of 78.79, with a standard deviation of 18.528. There are 262 respondents in the group 2 comprising of respondents from either third or fourth year, and they have a mean of 74.49, with a standard deviation of 15.894.

Personality Development and Industry Exposure: There are 238 respondents in the group 1 comprising of respondents from either first or second year, and they have a mean of 37.26, with a standard deviation of 10.088. There are 262 respondents in the group 2 comprising of respondents from either third or fourth year, and they have a mean of 35.95, with a standard deviation of 9.086.

Placements: There are 238 respondents in the group 1 comprising of respondents from either first or second year, and they have a mean of 14.82, with a standard deviation of 4.808. There are 262 respondents in the group 2 comprising of respondents from either third or fourth year, and they have a mean of 14.51, with a standard deviation of 4.845.

		Independent Samples Test								
		Levene's Test for Equality of Variances		t test for-Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2tailed)	Mean -Difference	Std. Error Difference	Lower	Upper
Selection	Equal variances assumed	.065	.799	.570	498	.569	.187	.329	-.458	.833
	Equal variances not assumed			.569	490.057	.570	.187	.329	-.459	.834
Academic Excellence	Equal variances assumed	.004	.952	.434	498	.664	.332	.765	-1.171	1.836
	Equal variances not assumed			.433	488.633	.665	.332	.767	-1.175	1.839
Infrastructure	Equal variances assumed	2.625	.106	2.791	498	.005	4.298	1.540	1.272	7.323
	Equal variances not assumed			2.770	469.328	.006	4.298	1.551	1.249	7.346
Personality Development And Industry Exposure	Equal variances assumed	1.714	.191	1.523	498	.128	1.306	.858	-.379	2.991
	Equal variances not assumed			1.515	478.869	.130	1.306	.862	-.387	2.999
Placements	Equal variances assumed	.020	.889	.722	498	.471	.312	.432	-.537	1.161
	Equal variances not assumed			.722	494.109	.470	.312	.432	-.537	1.161
Management And Administration	Equal variances assumed	2.671	.103	-1.125	498	.261	-.724	.643	-1.987	.540
	Equal variances not assumed			-1.130	497.811	.259	-.724	.641	-1.982	.535

INTERPRETATIONS: Following are the null and alternative hypotheses:
H0: μ of group 1 = μ of group 2
Ha: μ of group 1 $\neq$ μ of group 2

Table 6. Showing the independent samples test with reference to "year" of the sample.

Management and Administration: There are 238 respondents in the group 1 comprising of respondents from either first or second year, and they have a mean of 27.18, with a standard deviation of 6.887. There are 262 respondents in the group 2 comprising of respondents from either third or fourth year, and they have a mean of 27.91, with a standard deviation of 7.436.

Where μ is the mean number of group.

Table 6 shows the independent samples test with reference to "year" of the sample.

Selection: The inferential statistics gives the significance (p value) of Levene's test which is 0.799. As 0.799 is larger than α (usually 0.05), so accept the null hypothesis and thus it can be assumed that the variances are equal and it would use the middle row of the output. Assuming equal variances, the t value is 0.570. There are 498 degrees of freedom. The two-tailed p value associated with the test 0.569. As before, the decision rule is given by: If $p \leq \alpha$, then reject H0. Here, 0.569 is more than to 0.05, so its clear to accept H0. That implies that it do not observe a difference in the mean number of the two groups.

Thus, t test revealed statistically no difference between the mean number of two groups, where group 1 has ($M = 15.13$, $s = 3.728$) and the group 2 has ($M = 14.94$, $s = 3.614$), $t(498) = 0.570$, $p = 0.569$, $\alpha = 0.05$.

Academic Excellence: The inferential statistics gives the significance (p value) of Levene's test which is 0.952. As 0.952 is larger than α (usually 0.05), hence accept the null hypothesis and thus it can be assumed that the variances are equal and it would use the middle row of the output. Assuming equal variances, the t value is 0.434. There are 498 degrees of freedom. The two-tailed p value associated with the test 0.664. As before, the decision rule is given by: If $p \leq \alpha$, then reject H0. Here, 0.664 is more than to 0.05, so its clear to accept H0. That implies that it do not observe a difference in the mean number of the two groups.

Thus, t test revealed statistically no difference between the mean number of two groups, where group 1 has ($M = 36.88$, $s = 8.735$) and the group 2 has ($M = 36.55$, $s = 8.373$), $t(498) = 0.434$, $p = 0.664$, $\alpha = 0.05$.

Infrastructure: The inferential statistics gives the significance (p value) of Levene's test which is 0.106. As 0.106 is larger than α (usually 0.05), hence, accept the null hypothesis and thus it can be assumed that the variances are equal and it would use the middle row of the output. Assuming equal variances, the t value is 2.791. There are 498 degrees of freedom. The two-tailed p value associated with the test 0.005. As before, the decision rule is given by: If $p \leq \alpha$, then reject H0. Here, 0.005 is less than to 0.05, so its better to reject H0. That implies that it observe a difference in the mean number of the two groups.

Thus, t test revealed a statistically reliable difference between the mean number of two groups, where group 1 has ($M = 78.79$, $s = 18.528$) and the group 2 has ($M = 74.49$, $s = 15.894$), $t(498) = 2.791$, $p = 0.005$, $\alpha = 0.05$.

Personality Development and Industry Exposure: The inferential statistics gives the significance (p value) of Levene's test which is 0.191. As 0.191 is larger than α (usually 0.05), hence accept the null hypothesis and thus it can be assumed that the variances are equal and it would use the middle row of the output. Assuming equal variances, the t value is 1.523. There are 498 degrees of freedom. The two-tailed p value associated with the test 0.128. As before, the decision rule is given by: If $p \leq \alpha$, then reject H0. Here, 0.128 is more than to 0.05, so its clear to accept H0. That implies that it do not observe a difference in the mean number of the two groups.

Thus, t test revealed statistically no difference between the mean number of two groups, where group 1 has ($M = 37.26$, $s = 10.088$) and the group 2 has ($M = 35.95$, $s = 9.086$), $t(498) = 1.523$, $p = 0.128$, $\alpha = 0.05$.

Placements: The inferential statistics gives the significance (p value) of Levene's test which is 0.889. As 0.889 is larger than α (usually 0.05), hence, accept the null hypothesis and thus it can be assumed that the variances are equal and it would use the middle row of the output. Assuming equal variances, the t value is 0.722. There are 498 degrees of freedom. The two-tailed p value associated with the test 0.471. As before, the decision rule is given by: If $p \leq \alpha$, then reject H0. Here, 0.471 is more than to 0.05, so its clear to accept H0. That implies that it do not

observe a difference in the mean number of the two groups.

Thus, t test revealed statistically no difference between the mean number of two groups, where group 1 has (M = 14.82, s = 4.808) and the group 2 has (M = 14.51, s = 4.845), t(498) = 0.722, p = 0.471, α = 0.05.

Management and Administration: The inferential statistics gives the significance (p value) of Levene's test which is 0.103. As 0.103 is larger than α (usually 0.05), hence accept the null hypothesis and thus it can be assumed that the variances are equal and it would use the middle row of the output. Assuming equal variances, the t value is 1.125. There are 498 degrees of freedom. The two-tailed p value associated with the test 0.261. As before, the decision rule is given by: If p ≤α, then reject H0. Here, 0.261 is more than to 0.05, so we accept H0. That implies that it do not observe a difference in the mean number of the two groups.

Thus, t test revealed statistically no difference between the mean number of two groups, where group 1 has (M = 27.18, s = 6.887) and the group 2 has (M = 27.91, s = 7.436), t(498) = 1.125, p = 0.261, α = 0.05.

Recommendations

- The results of the study have to be read in light of students' expectations about different parameters.
- Further study of the same nature could be conducted by studying the views and perceptions of other stakeholders' like faculty members, industry, management, parents and society about the role of various parameters which affect the quality of undergraduate engineering education.

Conclusions

Following are the results of the t test as given by,

There are 272 respondents in the group 1 having up to 20 years of age and there are 228 respondents in the group 2 having above 20 years of age. t test revealed statistically no difference between the mean number of two groups with reference to the 'age ' wise samples for the parameters "Selection", "Academic Excellence" and "Management and Administration". While t test revealed a statistically reliable difference between the mean number of two groups for the parameters "Infrastructure", "Personality Development and Industry Exposure" and "Placements".

There are 378 respondents in the group 1 comprising of male respondents and there are 122 respondents in the group 2 comprising of female respondents. t test revealed statistically no difference between the mean number of two groups with reference to the 'gender ' wise samples for the parameters "Selection", "Academic Excellence", Infrastructure", "Personality Development and Industry Exposure", "Placements" and "Management and Administration".

There are 238 respondents in the group 1 comprising of respondents from either first or second year and there are 262 respondents in the group 2 comprising of respondents from either third or fourth year. t test revealed statistically no difference between the mean number of two groups with reference to the 'year ' wise samples for the parameters "Selection", "Academic Excellence", "Personality Development and Industry Exposure", "Placements" and "Management and Administration". While t test revealed a statistically reliable difference between the mean number of two groups for the parameter "Infrastructure".

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