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"Statistical analysis of students' perspective (age wise, gender wise and year wise) of parameters affecting the quality of education in an affiliated undergraduate engineering institution: A case study"

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The objective of the study is to examine the students' perspective (age wise, gender wise and year wise) of parameters affecting the affiliated undergraduate engineering institution NCR, Haryana. The research 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 comprising of the students respondents. 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 for "Selection", "Academic Excellence", Infrastructure", "Personality Development & Industry Exposure" and "Placements", *t* test revealed a statistically reliable difference between the mean number of two groups. While for "Management & Administration", *t* test revealed statistically no difference between the mean number of two groups. For "Selection", "Academic Excellence", Infrastructure", "Personality Development & Industry Exposure", "Placements" and "Management & Administration", *t* test revealed statistically no difference between the mean number of two groups. For "Selection", "Academic Excellence", Infrastructure", "Personality Development & Industry Exposure", "Placements" and "Management & Administration", *t* test revealed statistically no difference between the mean number of two groups.

Keywords: academic, higher education, private technical, technical institution, quality education.

INTRODUCTION

Higher Education

Higher education needs to be viewed as a long-term social investment for the promotion of economic growth, cultural development, social cohesion, equity and justice. In order to meet the 11th Plan aim of inclusive growth and to ensure genuine endogenous and sustainable development along with social justice and equity the higher education sector has to play a pivotal role, especially in generating research-based knowledge and developing a critical mass of skilled and educated personnel. Within this philosophical paradigm some of the issues pertaining to the higher education system have been identified, that need to be seriously addressed for the balanced development of higher education in India.The globalized era has necessitated inculcation of competitiveness. This can be achieved only by

bringing quality of highest standards in every sphere of work. Therefore, the quality of higher education has become a major concern as of today. Needs and expectations of the society are changing very fast and the quality of higher education needs to be sustained at the desired level. Quality would mainly depend on the quality of all its facets, be it the Faculty, Staff, Students, Infrastructure, etc. As such, all the policies, systems and processes should be clearly directed towards attaining improvements in all the relevant facets for the overall rise in the quality of 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. We can summarize a few points as under:

- 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.

Quality of education

Given that we need to compete globally in the 21st century, our education system should adopt certain benchmarking techniques for improving instruction models and administrative procedures in universities/colleges to move forward. We need a thorough study and evaluation of models implemented elsewhere and work out strategies to adopt such models in our system. Benchmarking would provide benefits to our education system in terms of reengineering, setting right objectives, etc. The country is showing consistency in economic growth pattern, leading the world in terms of information and technology, modernization, various economic activities and pushing for higher share of industries and services sectors of the economy but there is one area which needs reform is “education system”. While it is true that some investments are taking place in the country’s higher education system, we are yet to establish world class research facilities, recruiting profound academicians in universities/colleges/research institutions, etc. to sustain and forge lead in economic development. It is important to understand that countries like China, Singapore, South Korea, etc. are moving fast in investing in education system. Therefore, it is imperative that our educational institutions are equipped with the desired quality and standards which are essentials for transforming the younger workforce into productive ones. Needless to reiterate that in the higher education system focus on use of technology for effective learning by students also need to be encouraged to have cutting edge over our competitors in the globalised world.

LITERATURE REVIEW

Gafoor and Khabeer (2013) the study focuses on the first two criterions identified by NAAC to serve as the basis for its assessment procedure: Curricular Aspects Criterion, Teaching Learning and Evaluation. The procedure of the study uses the techniques of research and development with the following steps: (i) development of ICT model (ii) analysis of the model impact on the performance of the affiliated colleges. 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. It is a model that can be used in assessing the quality of education in Colleges of the University.

Bairagi and Shrivastava (2013) the objective of the study was to facilitate the creation of a right framework which may be used to evaluate all existing policies, schemes and judicial decisions. It was an evaluative study which was based on the secondary sources of the data. 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.

Satwashila Balaso Khamkar (2013) the objective of the study was to evolve mechanism through which the teaching and research professions become the most sought after profession of the nation. It was an evaluative study which was based on the secondary sources of the data. The study concluded that the quality of education does not only depend upon the infrastructure, curriculum, its goal, mission, aims and objectives but it largely depends upon the use of creating, shaping human capital into socially responsible, accountable, reliable individuals responsible to the society on the whole.

Sindhwani and Kumar (2013) the study highlights need and importance of values in higher education. It was an evaluative study which was based on the secondary sources of the data. 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.

Deshwal et al. (2012) The study was intended to design and test modified SERVQUAL instrument for undergraduate engineering institutes. A tool grounded on modified SERVQUAL was developed for undergraduate engineering students of Delhi. This tool was employed on 361 undergraduate students based on stratified random sampling. The descriptive analysis was done which was followed by the KMO test, factor analysis and reliability test. The study concluded that service quality research in engineering education is very useful for the university/colleges to study its weakness and familiarize its area of concerns. It will be extremely beneficial to accommodate the required changes so as to improve the standards of the service quality in this field. Eight factors were unveiled including satisfaction with the faculty teaching, faculty profile, academics, library, laboratory, campus infrastructure, competitive environment and inter-institute activities. All eight factors represented 68.590 % of variance. To know the perception of undergraduate engineering students is cardinal in ensuring service quality in engineering education. Compilation of students' perception is beneficial to management authorities of institutes.

V.V. Malagi (2012) The study emphasis that the higher education has a very important role in the development of the nation in the 21st century. Government has taken a number of initiatives during the Eleventh Five Year Plan period to increase access to higher education with equity and excellence. The author has used the descriptive method as well as analytical, based on the analysis of secondary data. The study concluded that the Report to the People on Education (2010-11) delineates major challenges as teacher recruitment and faculty development, promotion of research and doctorate programmes, quality of undergraduate colleges, promotion of humanities, social sciences and basic sciences disciplines and internationalizing higher education.

Sahoo and Agarwal (2012) The objective of the study was to provide electronic resources for the centrally funded and other academic institutions in Engineering, Science and Technology of India at highly discounted rates. The study discusses the selection of e-resources, review of e-resources, license agreement with publishers, usage analysis of various e-resources, economics of expenditure, research output of core members, archival access of e-resources for the core as well as other member of the consortium and future plan for the consortium. The study concluded that future plans of INDEST-AICTE Consortium include (i) considering a discovery solution for the INDEST-AICTE Consortium member as well as for the other member institutions of other Consortium of India, (ii) establishment of National coalition of all Library Consortia to have a common e-resources policy for India etc.

Milind Sohoni (2012) The objective of the study was to analyse the nature of research and development (R&D) as it is practised in our premier engineering institutes and its effect on India's development. The study suggested to bring an agreement on pedagogy and met a curriculum which is broad, inclusive, and participative and is implementable throughout the country, to develop course materials and protocols for knowledge accumulation for local needs, to develop projects which are executable at different colleges and develop a common platform for discussing action-research. Lastly to form a team of resource persons for every course composed of academicians, experts and practitioners.

Banerjee and Muley (2008) The study emphasis that Engineering in India is preferred option for bright students at the 10+2 level. This has resulted in a spurt in engineering colleges primarily in the private sector. Despite this, industry leaders complain about the absence of quality engineers for their industry. This is accompanied by significant unemployment rates amongst graduating engineers. The author has used the descriptive method as well as analytical, based on analysis of secondary data. The study concluded that it is important to understand the actual trends in numbers, placements, salaries, employability, research output and compare and benchmark performance with other institutions. An understanding of the reality should form the basis of policy changes that ensure that the engineering education system meets the changing needs of the industry and society.

Lueny Morell (2008) The study describes the motivation that gave raise to the Engineering for the Americas, a multi-country, multistate holder initiative that focuses on engineering education innovation and reform, quality assurance and assessment, and technology innovation as foundational elements to national and regional competitiveness in today's global economy. The author has used the descriptive method as well as analytical, based on the analysis of secondary data. The study concluded that if engineers are to create a world that has never been, then we need engineers with the right set of skills, competencies and values. It is imperative that engineering education reforms and innovates, focusing on outcomes, quality assurance and on producing engineers that society, regions, nations and the world need.

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 affiliated undergraduate engineering institution 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 an affiliated undergraduate engineering institution in NCR, Haryana.

Database collection: The primary data was collected with the help of questionnaire and personal interview method from an affiliated undergraduate engineering institution chosen randomly. And the secondary data was gathered through the study of 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 an affiliated undergraduate engineering institution in NCR, Haryana. The respondents are the students pursuing B.Tech who were selected randomly from the above said geographical area.

Statistical tools to be used: 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.

DATA ANALYSIS AND INTERPRETATIONS

Applying *t* TEST

Independent Samples Test (Age wise)

Table 1: Showing group statistics for students' sample (Age wise)

	Age	N	Mean	Std. Deviation	Std. Error Mean
Selection	Up to 20 years	306	16.09	3.681	.210
	Above 20 years	194	13.88	3.574	.257
Academic Excellence	Up to 20 years	306	40.69	8.740	.500
	Above 20 years	194	37.01	9.100	.653
Infrastructure	Up to 20 years	306	84.49	18.882	1.079
	Above 20 years	194	79.17	20.389	1.464
Personality Development And Industry Exposure	Up to 20 years	306	39.86	8.657	.495
	Above 20 years	194	37.54	9.851	.707
Placements	Up to 20 years	306	16.75	4.468	.255
	Above 20 years	194	15.58	4.798	.344
Management And Administration	Up to 20 years	306	29.66	6.731	.385
	Above 20 years	194	28.72	8.131	.584

INTERPRETATIONS: The table gives the descriptive statistics for each of the two groups (as defined by the grouping variable). The last column gives the standard error of the mean for each of the two groups. There are 306 respondents in the group 1 having up to 20 years of age, and 194 respondents in the group 2 having above 20 years of age.

Table 2: Showing Independent Samples Test (Age wise) for students' sample

		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	.005	.945	6.622	498	.000	2.212	.334	1.556	2.868
	Equal variances not assumed			6.666	419.763	.000	2.212	.332	1.560	2.864

Continuation of **Table 2**……..

Academic Excellence	Equal variances assumed	.008	.928	4.510	498	.000	3.676	.815	2.075	5.277
	Equal variances not assumed			4.469	398.492	.000	3.676	.822	2.059	5.293
Infrastructure	Equal variances assumed	.894	.345	2.978	498	.003	5.323	1.788	1.811	8.836
	Equal variances not assumed			2.927	387.452	.004	5.323	1.819	1.747	8.899
Personality Development And Industry Exposure	Equal variances assumed	2.598	.108	2.766	498	.006	2.320	.839	.672	3.968
	Equal variances not assumed			2.688	371.857	.008	2.320	.863	.623	4.017
Placements	Equal variances assumed	1.324	.250	2.755	498	.006	1.163	.422	.333	1.992
	Equal variances not assumed			2.711	389.103	.007	1.163	.429	.319	2.006
Management And Administration	Equal variances assumed	10.489	.001	1.405	498	.161	.942	.670	-.376	2.259
	Equal variances not assumed			1.347	354.766	.179	.942	.699	-.433	2.317

INTERPRETATIONS: Following are the null and alternative hypotheses:
H0: μ of group 1 = μ of group 2
H1: μ of group 1 ≠ μ of group 2

Where μ is the mean number of group

1. Selection: The inferential statistics gives the significance (p value) of Levene's test which is 0.945. As 0.945 is larger than α (usually 0.05), we accept the null hypothesis and thus it can be assumed that the variances are equal and we would use the middle row of the output. Assuming equal variances, the t

value is 6.622. There are 498 degrees of freedom. The two-tailed p value associated with the test 0.000. As before, the decision rule is given by: If $p \leq \alpha$, then reject H0. Here, 0.000 is less than to 0.05, so we can reject H0. That implies that we 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 = 16.09, s = 3.681) and the group 2 has (M = 13.88, s = 3.574), *t (498)* = 6.22, *p* = 0.000, α = 0.05.

2. Academic Excellence: The inferential statistics gives the significance (p value) of Levene's test which is 0.928. As 0.928 is larger than α (usually 0.05), we accept the null hypothesis and thus it can be assumed that the variances are equal and we would use the middle row of the output. Assuming equal variances, the t value is 4.510. There are 498 degrees of freedom. The two-tailed p value associated with the test 0.000. As before, the decision rule is given by: If $p \leq \alpha$, then reject H0. Here, 0.000 is less than to 0.05, so we can reject H0. That implies that we 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 = 40.69, s = 8.740) and the group 2 has (M = 37.01, s = 9.100), *t (498)* = 4.510, *p* = 0.000, α = 0.05.

3. Infrastructure: The inferential statistics gives the significance (p value) of Levene's test which is 0.345. As 0.345 is larger than α (usually 0.05), we accept the null hypothesis and thus it can be assumed that the variances are equal and we would use the middle row of the output. Assuming equal variances, the t value is 2.978. There are 498 degrees of freedom. The two-tailed p value associated with the test 0.003. As before, the decision rule is given by: If $p \leq \alpha$, then reject H0. Here, 0.003 is less than to 0.05, so we can reject H0. That implies that we 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 = 84.49, s = 18.882) and the group 2 has (M = 79.17, s = 20.389), *t (498)* = 2.978, *p* = 0.003, α = 0.05.

4. Personality Development and Industry Exposure: The inferential statistics gives the significance (p value) of Levene's test which is 0.108. As 0.108 is larger than α (usually 0.05), we accept the null hypothesis and thus it can be assumed that the variances are equal and we would use the middle row of the output. Assuming equal variances, the t value is 2.766. There are 498 degrees of freedom. The two-tailed p value associated with the test 0.006. As before, the decision rule is given by: If $p \leq \alpha$, then reject H0. Here, 0.006 is less than to 0.05, so we can reject H0. That implies that we 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 = 39.86, s = 8.657) and the group 2 has (M = 37.54, s = 9.851), *t (498)* = 2.766, *p* = 0.006, α = 0.05.

5. Placements: The inferential statistics gives the significance (p value) of Levene's test which is 0.250. As 0.250 is larger than α (usually 0.05), we accept the null hypothesis and thus it can be assumed that the variances are equal and we would use the middle row of the output. Assuming equal variances, the t value is 2.755. There are 498 degrees of freedom. The two-tailed p value associated with the test 0.006. As before, the decision rule is given by: If $p \leq \alpha$, then reject H0. Here, 0.006 is less than to 0.05, so we can reject H0. That implies that we 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 = 16.75, s = 4.468) and the group 2 has (M = 15.58, s = 4.798), *t (498)* = 2.755, *p* = 0.006, α = 0.05.

6. Management and Administration: The inferential statistics gives the significance (p value) of Levene's test which is 0.001. As 0.001 is less than α (usually 0.05), we reject the null hypothesis and thus it can be assumed that the variances are unequal and we would use the last row of the output. Assuming unequal variances, the t value is 1.347. There are 354 degrees of freedom. The two-tailed p value associated with the test 0.179. As before, the decision rule is given by: If p ≤ α, then reject H0. Here, 0.179 is more than to 0.05, so we 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 = 29.66, s = 6.731) and the group 2 has (M = 28.72, s = 8.131), *t (354)* = 1.347, *p* = 0.179, α = 0.05.

Independent Samples Test (Gender wise)

Table 3: Showing group statistics for students' sample (Gender wise)

	Gender	**N**	**Mean**	**Std. Deviation**	**Std. Error Mean**
Selection	Male	306	15.34	4.020	.230
	Female	194	15.06	3.408	.245
Academic Excellence	Male	306	39.59	9.596	.549
	Female	194	38.73	8.114	.583
Infrastructure	Male	306	83.64	21.227	1.213
	Female	194	80.52	16.689	1.198
Personality Development And Industry Exposure	Male	306	38.91	9.522	.544
	Female	194	39.03	8.689	.624
Placements	Male	306	16.24	4.790	.274
	Female	194	16.39	4.373	.314
Management And Administration	Male	306	29.46	7.850	.449
	Female	194	29.04	6.385	.458

INTERPRETATIONS: The table gives the descriptive statistics for each of the two groups (as defined by the grouping variable). The last column gives the standard error of the mean for each of the two groups. There are 306 respondents in the group 1 comprising of male respondents, and 194 respondents in the group 2 comprising of female respondents.

Table 4: Showing Independent Samples Test (Gender wise) for students' sample

	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

Continuation of **Table 4**

Selection	Equal variances assumed	3.973	.047	.789	498	.430	.275	.348	-.409	.959
	Equal variances not assumed			.819	458.114	.413	.275	.336	-.385	.934
Academic Excellence	Equal variances assumed	2.633	.105	1.039	498	.299	.863	.831	-.769	2.495
	Equal variances not assumed			1.078	458.756	.281	.863	.800	-.710	2.435
Infrastructure	Equal variances assumed	7.162	.008	1.738	498	.083	3.125	1.798	-.408	6.658
	Equal variances not assumed			1.833	475.442	.067	3.125	1.705	-.226	6.476
Personality Development And Industry Exposure	Equal variances assumed	.252	.616	-.135	498	.893	-.114	.845	-1.774	1.546
	Equal variances not assumed			-.138	438.072	.891	-.114	.828	-1.741	1.513
Placements	Equal variances assumed	1.135	.287	-.356	498	.722	-.151	.425	-.987	.684
	Equal variances not assumed			-.363	437.994	.717	-.151	.417	-.970	.667
Management And Administration	Equal variances assumed	2.916	.088	.637	498	.524	.428	.672	-.891	1.747
	Equal variances not assumed			.667	468.115	.505	.428	.642	-.833	1.689

INTERPRETATIONS: Following are the null and alternative hypotheses:
H0: μ of group 1 = μ of group 2
H1: μ of group 1 ≠ μ of group 2

Where μ is the mean number of group

1. Selection: The inferential statistics gives the significance (p value) of Levene's test which is 0.047. As 0.047 is less than α (usually 0.05), we reject the null hypothesis and thus it can be assumed that the variances are unequal and we would use the last row of the output. Assuming unequal variances, the t value is 0.819. There are 458 degrees of freedom. The two-tailed p value associated with the test 0.413. As before, the decision rule is given by: If $p \leq \alpha$, then reject H0. Here, 0.413 is more than to 0.05, so we 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 = 15.34, s = 4.020) and the group 2 has (M = 15.06, s = 3.408), *t (458)* = 0.819, *p* = 0.413, α = 0.05.

2. Academic Excellence: The inferential statistics gives the significance (p value) of Levene's test which is 0.105. As 0.105 is larger than α (usually 0.05), we accept the null hypothesis and thus it can be assumed that the variances are equal and we would use the middle row of the output. Assuming equal variances, the t value is 1.039. There are 498 degrees of freedom. The two-tailed p value associated with the test 0.299. As before, the decision rule is given by: If $p \leq \alpha$, then reject H0. Here, 0.299 is more than to 0.05, so we 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 = 39.59, s = 9.596) and the group 2 has (M = 38.73, s = 8.114), *t (498)* = 1.039, *p* = 0.299, α = 0.05.

3. Infrastructure: The inferential statistics gives the significance (p value) of Levene's test which is 0.008. As 0.008 is less than α (usually 0.05), we reject the null hypothesis and thus it can be assumed that the variances are unequal and we would use the last row of the output. Assuming unequal variances, the t value is 1.833. There are 475 degrees of freedom. The two-tailed p value associated with the test 0.067. As before, the decision rule is given by: If $p \leq \alpha$, then reject H0. Here, 0.067 is more than to 0.05, so we 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 = 83.64, s = 21.227) and the group 2 has (M = 80.52, s = 16.689), *t (475)* = 1.833, *p* = 0.067, α = 0.05.

4. Personality Development and Industry Exposure: The inferential statistics gives the significance (p value) of Levene's test which is 0.616. As 0.616 is larger than α (usually 0.05), we accept the null hypothesis and thus it can be assumed that the variances are equal and we would use the middle row of the output. Assuming equal variances, the t value is 0.135. There are 498 degrees of freedom. The two-tailed p value associated with the test 0.893. As before, the decision rule is given by: If $p \leq \alpha$, then reject H0. Here, 0.893 is more than to 0.05, so we 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 = 38.91, s = 9.522) and the group 2 has (M = 39.03, s = 8.689), *t (498)* = 0.135, *p* = 0.893, α = 0.05.

5. Placements: The inferential statistics gives the significance (p value) of Levene's test which is 0.287. As 0.287 is larger than α (usually 0.05), we accept the null hypothesis and thus it can be assumed that the variances are equal and we would use the middle row of the output. Assuming equal variances, the t value is 0.356. There are 498 degrees of freedom. The two-tailed p value associated with the test 0.722. As before, the decision rule is given by: If $p \leq \alpha$, then reject H0. Here, 0.722 is more than to 0.05, so we 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 = 16.24, s = 4.790) and the group 2 has (M = 16.39, s = 4.373), *t (498)* = 0.356, *p* = 0.722, α = 0.05.

6. Management and Administration: The inferential statistics gives the significance (p value) of Levene's test which is 0.088. As 0.088 is larger than α (usually 0.05), we accept the null hypothesis and thus it can be assumed that the variances are equal and we would use the middle row of the output. Assuming equal variances, the t value is 0.637. There are 498 degrees of freedom. The two-tailed p value associated with the test 0.524. As before, the decision rule is given by: If p ≤ α, then reject H0. Here, 0.524 is more than to 0.05, so we 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 = 29.46, s = 7.850) and the group 2 has (M = 29.04, s = 6.385), *t (498)* = 0.637, *p* = 0.524, α = 0.05.

Independent Samples Test (Year wise)

Table 5: Showing group statistics for students' sample (Year wise)

	Year	N	Mean	Std. Deviation	Std. Error Mean
Selection	First or Second	275	15.49	3.849	.232
	Third or Fourth	225	14.91	3.707	.247
Academic Excellence	First or Second	275	39.71	8.628	.520
	Third or Fourth	225	38.71	9.533	.636
Infrastructure	First or Second	275	83.90	19.295	1.164
	Third or Fourth	225	80.63	19.933	1.329
Personality Development And Industry Exposure	First or Second	275	38.76	8.375	.505
	Third or Fourth	225	39.20	10.129	.675
Placements	First or Second	275	16.08	4.145	.250
	Third or Fourth	225	16.56	5.156	.344
Management And Administration	First or Second	275	29.51	6.901	.416
	Third or Fourth	225	29.04	7.795	.520

INTERPRETATIONS: The table gives the descriptive statistics for each of the two groups (as defined by the grouping variable). The last column gives the standard error of the mean for each of the two groups. There are 275 respondents in the group 1 comprising of respondents from either first or second year, and 225 respondents in the group 2 comprising of respondents from either third or fourth year.

Table 6: Showing Independent Samples Test (Year wise) for students' sample

	Levene's Test for Equality of Variances	t-test for Equality of Means	
			95% Confidence Interval of the Difference

Continuation of **Table 6**

		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Selection	Equal variances assumed	.122	.727	1.704	498	.089	.580	.340	-.089	1.248
	Equal variances not assumed			1.710	484.962	.088	.580	.339	-.086	1.246
Academic Excellence	Equal variances assumed	.991	.320	1.237	498	.217	1.006	.813	-.592	2.604
	Equal variances not assumed			1.225	457.034	.221	1.006	.821	-.608	2.620
Infrastructure	Equal variances assumed	.000	.999	1.860	498	.063	3.275	1.761	-.184	6.734
	Equal variances not assumed			1.854	472.221	.064	3.275	1.766	-.196	6.746
Personality Development And Industry Exposure	Equal variances assumed	8.360	.004	-.526	498	.599	-.436	.828	-2.061	1.190
	Equal variances not assumed			-.517	433.746	.606	-.436	.843	-2.093	1.222
Placements	Equal variances assumed	7.923	.005	-1.143	498	.253	-.476	.416	-1.293	.342
	Equal variances not assumed			-1.119	426.124	.264	-.476	.425	-1.311	.360
Management And Administration	Equal variances assumed	3.359	.067	.701	498	.484	.461	.658	-.831	1.753
	Equal variances not assumed			.692	451.615	.489	.461	.666	-.847	1.769

INTERPRETATIONS: Following are the null and alternative hypotheses:

H0: μ of group 1 = μ of group 2
H1: μ of group 1 ≠ μ of group 2

Where μ is the mean number of group

1. Selection: The inferential statistics gives the significance (p value) of Levene's test which is 0.727. As 0.727 is larger than α (usually 0.05), we accept the null hypothesis and thus it can be assumed that the variances are equal and we would use the middle row of the output. Assuming equal variances, the t value is 1.704. There are 498 degrees of freedom. The two-tailed p value associated with the test 0.089. As before, the decision rule is given by: If p ≤ α, then reject H0. Here, 0.089 is more than to 0.05, so we 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 = 15.49, s = 3.849) and the group 2 has (M = 14.91, s = 3.707), *t (498)* = 1.704, *p* = 0.089, α = 0.05.

2. Academic Excellence: The inferential statistics gives the significance (p value) of Levene's test which is 0.320. As 0.320 is larger than α (usually 0.05), we accept the null hypothesis and thus it can be assumed that the variances are equal and we would use the middle row of the output. Assuming equal variances, the t value is 1.237. There are 498 degrees of freedom. The two-tailed p value associated with the test 0.217. As before, the decision rule is given by: If p ≤ α, then reject H0. Here, 0.217 is more than to 0.05, so we 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 = 39.71, s = 8.628) and the group 2 has (M = 38.71, s = 9.533), *t (498)* = 1.237, *p* = 0.217, α = 0.05.

3. Infrastructure: The inferential statistics gives the significance (p value) of Levene's test which is 0.999. As 0.999 is larger than α (usually 0.05), we accept the null hypothesis and thus it can be assumed that the variances are equal and we would use the middle row of the output. Assuming equal variances, the t value is 1.860. There are 498 degrees of freedom. The two-tailed p value associated with the test 0.063. As before, the decision rule is given by: If p ≤ α, then reject H0. Here, 0.063 is more than to 0.05, so we 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 = 83.90, s = 19.295) and the group 2 has (M = 80.63, s = 19.933), *t (498)* = 1.860, *p* = 0.063, α = 0.05.

4. Personality Development and Industry Exposure: The inferential statistics gives the significance (p value) of Levene's test which is 0.004. As 0.004 is less than α (usually 0.05), we reject the null hypothesis and thus it can be assumed that the variances are unequal and we would use the last row of the output. Assuming unequal variances, the t value is 0.517. There are 433 degrees of freedom. The two-tailed p value associated with the test 0.606. As before, the decision rule is given by: If p ≤ α, then reject H0. Here, 0.606 is more than to 0.05, so we 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 = 38.76, s = 8.375) and the group 2 has (M = 39.20, s = 10.129), *t (433)* = 0.517, *p* = 0.606, α = 0.05.

5. Placements: The inferential statistics gives the significance (p value) of Levene's test which is 0.005. As 0.005 is less than α (usually 0.05), we reject the null hypothesis and thus it can be assumed that the variances are unequal and we would use the last row of the output. Assuming unequal variances, the t

value is 1.119. There are 426 degrees of freedom. The two-tailed p value associated with the test 0.264. As before, the decision rule is given by: If p ≤ α, then reject H0. Here, 0.264 is more than to 0.05, so we 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 = 16.08, s = 4.145) and the group 2 has (M = 16.56, s = 5.156), *t (426)* = 1.119, *p* = 0.264, α = 0.05.

6. Management and Administration: The inferential statistics gives the significance (p value) of Levene's test which is 0.067. As 0.067 is larger than α (usually 0.05), we accept the null hypothesis and thus it can be assumed that the variances are equal and we would use the middle row of the output. Assuming equal variances, the t value is 0.701. There are 498 degrees of freedom. The two-tailed p value associated with the test 0.484. As before, the decision rule is given by: If p ≤ α, then reject H0. Here, 0.484 is more than to 0.05, so we 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 = 29.51, s = 6.901) and the group 2 has (M = 29.04, s = 7.795), *t (498)* = 0.701, *p* = 0.484, α = 0.05.

CONCLUSIONS

Independent Samples Test (Age wise)
For “Selection”, “Academic Excellence”, “Infrastructure”, “Personality Development & Industry Exposure” and “Placements”, *t* test revealed a statistically reliable difference between the mean number of two groups. Thus it can be inferred that the two samples (age wise) have varied perceptions with respect to the above parameters. While for “Management & Administration”, *t* test revealed statistically no difference between the mean number of two groups. Thus it can be inferred that the two samples (age wise) have same perceptions with respect to the above parameter.

Independent Samples Test (Gender wise)
For “Selection”, “Academic Excellence”, “Infrastructure”, “Personality Development & Industry Exposure”, “Placements” and “Management & Administration”, *t* test revealed statistically no difference between the mean number of two groups. Thus it can be inferred that the two samples (gender wise) have same perceptions with respect to the above parameters.

Independent Samples Test (Year wise)
For “Selection”, “Academic Excellence”, “Infrastructure”, “Personality Development & Industry Exposure”, “Placements” and “Management & Administration”, *t* test revealed statistically no difference between the mean number of two groups. Thus it can be inferred that the two samples (year wise) have same perceptions with respect to the above parameters.

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