Factors Influencing University Students' Performance: A Comparison of Faculties' Assumptions with Students' Perceptions

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Abstract - **In the previous research, it was proved that there were so many factors like students' personal characteristics, family background, learning habits, previous academic background, college environment etc. which influence directly or indirectly the performance of college students in their university examination. The number of such factors has been identified by studying the previous work carried out by different researchers in different geographical areas and boundaries of the world. In many researches, when the opinions of the students and teaching faculties has been taken for similar factors to know the importance of these factors, the significant differences was found in their opinion for some factors. This paper investigates and compares the faculties' assumptions with the students' perceptions for various influencing factors. The comparison is done on the basis of their ranking of mean values of the factors allocated by students and faculties independently as per the importance of factors and one way ANOVA is used to check the significance of differences in their opinion. The result shows that there are similarities in the opinions of both, faculties and students, for most of the factors. But for some factors the significant differences in their opinion is also observed. The result of this research can be used for enhancing the performance of students by improving the influencing factors rank-wise. Top ranked factors may be given higher priority. Also this study will provide a platform for continuing the debate on the importance of various influencing factors for engineering students.**
Keywords: **Students' Performance, Influencing Factors, Performing Factors, University Examination, Faculties' Assumptions, Students' Perceptions**

I. INTRODUCTION

India has shown a stupendous growth of its techno-economic progress, over the last 70 years of post independence period. Gradually, India is becoming self reliance in various sectors and key areas including space technology, IT sector, and food security etc. Now, Indian economy has become world's largest sixth economy by nominal GDP, above all making India proud by fulfilling the requirement of technical manpower of the advanced countries of the world.

At the time of independence, there were only 87 technical institutions (including polytechnics, pharmacy and architecture institutions) in the country with an intake capacity of 6600. Due to the effective implementation of successive Five Year plans and changes in the technical education policy in the eighties to permit private and charitable organizations to open new technical institutions on self-financing basis, the growth of technical education has been phenomenal. The country has seen the quantitative growth of engineering institutions at diploma, degree and postgraduate level during this period, particularly in last decade. Figure 1 shows the growth of intake in AICTE approved technical institutions (UG) during last 10 years [1].
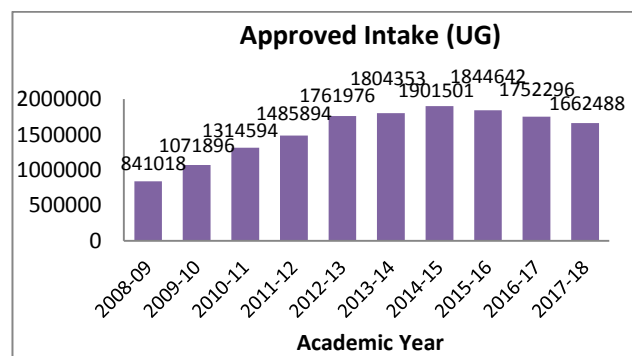

Fig. 1   Growth of Intake in AICTE Approved Technical Institutions (UG)

The availability of large number of engineering seats in the country has created opportunity for 12th class students with lower scores to take admission to engineering courses, there by affecting the results. The poor result has also adversely affected the placement. As such now result of students has become the highest concern of engineering education system. Many efforts were being taken by the top management and academicians to increase the results, but these efforts were not focussed due to lack of approach for identification of real parameters. If it is possible to know in advance which students are likely to fail, the corrective action such as arranging extra and personal improvement classes, use of advanced tools for teaching etc. can be taken by the college management and the faculties to improve the results. This will certainly help in improving the placements. Good placement is the most important factor that will help the college to attract the students [2].

The previous studies proved that student's university results can be improved by predicting and controlling the influencing factors which affect their academic

performance. There are certain parameters like family background, personal characteristics, high school academic background, college environment etc. which have significant impact on the performance and results of students. Most of the studies are focused on students' performance in the foreign universities, which may not be suitable for Indian universities due to the differences in their academic, social and cultural environment. So there is need to investigate the influencing factors and their importance for the performance of students' of Indian universities [3]. Semester/cumulative grade point average (SGPA/CGPA) and success/failure in the university examination have been taken as the performance measuring variable in various researches [4].

There are two approaches for investigating the success of university students', the first approach is to correlate the performance of university students with their influencing factors which is based on real data collected through questionnaires and college records and second approach is based on opinions of faculties and students only. The speciality of second approach is that students' perceptions strongly influence their behaviours regardless of the actual influence of those factors. But there is some risk in the second approach that this can either help or hamper the student's progress [5]. Similarly, faculties' assumptions will also influence their behaviours and it may change their thoughts and teaching methodology. Problem will arise when there is a significant difference in their opinions. This study aims to minimise such type of problems.

This study will help the students to know the importance of influencing factors which can affect their academic performance. It will make them able to improve their academic performance. This study may be useful for the parents and faculties to understand the difficulties faced by the students and provide them proper guidance and support. College administrators may be able to frame better teaching-learning policies and develop students' friendly learning process [6].

II. METHODOLOGY APPLIED

For conducting this study, the influencing factors are taken as independent factors and performing factors as dependent factors. In this survey, the possible influencing factors were explored by literature survey and through the opinions of students, faculties, experts and using own intelligence. Then a preliminary survey was conducted to identify significant influencing factors and know their importance. Descriptive statistics and one way ANOVA technique were used for data analysis.

A. Exploration of Factors

An exhaustive literature survey was conducted to explore the possible influencing factors and frequently used performing factors. These influencing factors include students' personal characteristics, their learning habits, previous academic background, family background and college environment etc. From the previous research work 48 significant influencing factors and 5 frequently used performing factors were shortlisted [4]. But only these factors were not sufficient to predict the performance of engineering students. So to add more factors, the opinions of 79 engineering students and 19 engineering faculties were taken. By this process 40 influencing factors were identified. Then a combined list of influencing factors was prepared. There were some similar factors which were merged together and finally a comprehensive list of 75 influencing factors and 5 performing factors was prepared [7].

B. Identification of Important Factors

A preliminary survey was conducted to identify and select most important factors that would be included in the final questionnaire. The purpose of this survey was to obtain qualitative data which would enable the researchers to identify the most important factors that students and faculties saw as influencing students' academic performance [8].

The questionnaire survey methodology was adopted for this research study and a questionnaire was developed as shown in Table I to gather data from students and faculties. The first section of the questionnaire included the personal details of the participant and the second section included 75 influencing and 5 performing factors as discussed in [9]. Respondents were asked to mark the correct option on 5 degrees Linkert-type scale [10] as per the importance of the factors in their opinion. The most important factor was marked as 5 and least important as 1. In addition to the above influencing and performing factors, the questionnaire contained items for collecting demographic data such as name, gender, department/branch, mobile number of students and faculties.

TABLE I PRELIMINARY QUESTIONNAIRE TO SHORTLIST IMPORTANT FACTORS

Questionnaire to Shortlist the Selective and Important Parameters which affect the Performance of Engineering Students in University Examination		
Dear Faculty Member/Student, This initial survey is being carried out to shortlist the selective and important parameters which are responsible for students' academic performance in university examination. These shortlisted parameters will be included in the final questionnaire. So kindly tick the appropriate option as per the importance you think. (1 = Least Important & 5 = Most Important) Thanks for your cooperation.		
Name of Faculty Member/Student: ……………………………		**Gender: Male/Female**
Department/Branch (Semester): …………………….…………		**Mobile No.:**

Note: Please tick (√) the appropriate option as per the importance you think.							
S. No.	**Independent/Influencing Parameters**	**Assign Weightage (1= Least Important & 5= Most Important)**					
		1	**2**	**3**	**4**	**5**	
1	Caste Category (SC/ST/NT/OBC/GEN)						
2	Medium of Instruction in 12th Class (Eng/Hindi/Semi-Eng)						
3	Examination Board (CG Board/CBSE/ICSE/Other)						
4	Aggregate Percentages of 10th Class						
5	Aggregate Percentages of 12th Class						
...	...	...	...	...	...	...	
...	...	...	...	...	...	...	
...	...	...	...	...	...	...	
71	Consistency in study						
72	Ability to work independently						
73	Assignment submission/continuous assessment						
74	Ability to manage stress						
75	Syllabus coverage						
S. No.	**Dependent/Performance Parameters**	**Assign Weightage (1= Least Important & 5= Most Important)**					
		1	**2**	**3**	**4**	**5**	
1	Aggregate Percentage in end sem. (final) exam						
2	Percentages of Only Theory Subjects in end sem. exam						
3	SPI/CPI (Sem./Cum. Performance Index) of end sem. exam						
4	Pass or Fail						
5	No. of attempts taken to clear the semester						
Date: / /				**Sign. of the Faculty Member/Student**			

C. Sample Selection

This preliminary survey included the students and faculties of the different engineering colleges of Chhattisgarh affiliated to Chhattisgarh Swami Vivekananda University, Bhilai. All the completely filled 191 questionnaires which included responses of 119 students and 72 teaching faculties, were received and data was tabulated in the excel sheet.
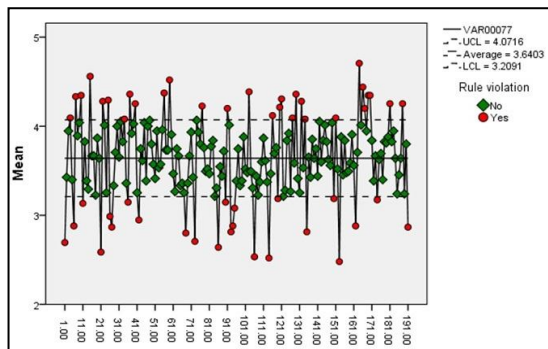

Fig. 2 $\overline{X}$ and R Control Chart for Elimination of Outliers

The outliers were removed by using statistical quality control process, $\overline{X}$ and R control chart, due to small sample size [11]. After eliminating the outliers, 138 combined (i.e.

students and faculties) samples remained which was further used for analysis purpose. The Reliability statistics was checked and it was found 0.757 as Cronbach's Alpha and 0.769 as Cronbach's alpha based on standardized items. Both values were greater than 0.7, indicated good support for internal consistency and reliability of the collected data [12]. KMO value of the data was found as 0.547 which was not showing good adequacy of data but can be accepted since it is greater than 0.5. Bartlett's test was found significant ($p = 0.000$) which is acceptable [13]. Therefore the data was found to be fit for further analysis.

III. RESULTS AND DISCUSSION

The combined data set of 138 participants was analyzed by using descriptive statistics and one way ANOVA in SPSS Statistics 20.0. Descriptive statistics was used to compute the means and standard deviation of the factors [14]. The mean values of each item allocated by students and faculties were calculated and all the items were ranked separately, for students and faculties, as per their mean values. All the items were arranged as per students' ranking order. Wherever the mean was found to be same, the standard deviation was taken into account and the factor with a lower value of standard deviation was given a higher rank [15].

TABLE II RANKING OF ALL INFLUENCING FACTORS BASED ON OPINIONS OF STAKEHOLDERS

S. No.	Influencing Factors	Stud Ave	Rank (by Stud)	Teach Ave	Rank (by Teach)	Rank Diff.	Std. Devi.	Signi. If $p<0.05$	Signi. Y/N
1	Self study/Regular Study at Home	4.570	1	4.481	2	1	0.063	.567	N
2	Family Support	4.570	2	3.962	32	30	0.430	.000	Y
3	Time Management	4.558	3	4.615	1	2	0.040	.658	N
4	Numerical Problem Solving ability	4.523	4	4.404	4	0	0.084	.352	N
5	Teacher's Support/ Appreciation/Inspiration & help	4.477	5	4.135	19	14	0.242	.032	Y
6	Availability of good study material/learning resources	4.360	6	4.288	10	4	0.051	.634	N
7	Lack of Concentration on study	4.360	7	4.288	11	4	0.051	.676	N
8	Written communication skill in English	4.326	8	4.135	20	12	0.135	.186	N
9	Lack of Revision at the last moment	4.326	9	4.135	21	12	0.135	.262	N
10	Syllabus coverage	4.256	10	4.019	26	16	0.168	.176	N
11	Lack of Self-confidence	4.244	11	4.154	18	9	0.064	.639	N
12	Sufficient Sleep	4.233	12	3.942	33	21	0.206	.099	N
13	Teachers Experience	4.221	13	4.000	27	14	0.156	.255	N
14	Desire to learn/acquire more knowledge	4.209	14	4.192	16	2	0.012	.916	N
15	Lack of Self-motivation	4.163	15	4.308	8	7	0.103	.438	N
16	Lack of Proper Presentation of answer in exam	4.151	16	4.288	12	4	0.097	.448	N
17	Ability to work independently	4.105	17	4.000	28	11	0.074	.569	N
18	Positive/Negative Attitude	4.093	18	4.327	7	13	0.165	.163	N
19	Active Participation in Class Discussion	4.070	19	4.212	13	6	0.100	.425	N
20	Academic environment of college	4.070	20	4.308	9	11	0.168	.156	N
21	Dedication to career goal	4.047	21	4.038	23	2	0.006	.968	N
22	Willingness to accept a challenge	4.000	22	3.942	34	12	0.041	.744	N
23	Consistency in study	4.000	23	4.212	14	9	0.150	.184	N
24	Lack of Hardworking	3.977	24	4.173	17	7	0.139	.330	N
25	Lack of Self-discipline	3.942	25	4.481	3	22	0.381	.009	Y
26	Ability to manage stress	3.942	26	3.981	29	3	0.028	.824	N
27	Positive influence of Friend/Friends help	3.930	27	3.885	38	11	0.032	.778	N
28	Habit to get clear doubts by Teachers	3.919	28	3.923	36	8	0.003	.980	N
29	Seriousness in CTs/UTs/Performance in Internal exams	3.919	29	4.212	15	14	0.207	.137	N
30	Sincere Preparation of Class Notes	3.884	30	4.346	5	25	0.327	.025	Y
31	Financial Condition of Family	3.826	31	3.269	58	27	0.394	.007	Y
32	Admission taken due to own/others interest	3.826	32	3.769	40	8	0.040	.795	N
33	Lack of Self-assessment	3.814	33	3.981	30	3	0.118	.367	N
34	Lack of Competitiveness	3.779	34	4.038	24	10	0.183	.207	N
35	Lack of Proper Utilization of weekly off	3.744	35	3.538	47	12	0.146	.310	N
36	Attendance in %/Regular/Irregular	3.709	36	4.346	6	30	0.450	.003	Y
37	Group study	3.698	37	3.481	51	14	0.153	.304	N
38	Lack of Persistence	3.663	38	4.038	25	13	0.265	.053	N
39	Laziness	3.605	39	3.731	42	3	0.089	.590	N
40	Balance between academic commitment & social life	3.593	40	3.500	49	9	0.066	.651	N

41	Lack of Self-esteem	3.581	41	3.769	41	0	0.133	.352	N
42	Career preference (Govt./Pvt./Own Business)	3.581	42	3.212	62	20	0.261	.112	N
43	Not fixing the target	3.570	43	3.942	35	8	0.263	.104	N
44	Fear of failures	3.523	44	3.558	46	2	0.025	.877	N
45	Uncertainty about future	3.512	45	3.346	56	11	0.117	.435	N
46	Teacher's Job Satisfaction	3.465	46	3.981	31	15	0.365	.013	Y
47	Live in/with (Hostel/Rented/ Family/Relatives)	3.442	47	3.365	54	7	0.054	.718	N
48	Seniors' support & help/Interaction with seniors	3.407	48	3.365	55	7	0.030	.844	N
49	Bad/Good Handwriting	3.395	49	3.500	50	1	0.074	.643	N
50	Medium of Instruction in 12th Class (Eng/Hindi/SemiEng)	3.384	50	3.635	45	5	0.177	.264	N
51	Percentages in Maths (12th Class) only	3.372	51	3.712	43	8	0.240	.128	N
52	Excessive use of internet/ cell phones	3.349	52	3.904	37	15	0.392	.016	Y
53	High expectations by Teachers	3.279	53	3.115	63	10	0.116	.393	N
54	Late night study	3.279	54	3.019	64	10	0.184	.249	N
55	Combined Percentages in Phy,Chem,Maths (12th Class)	3.244	55	4.115	22	33	0.616	.000	Y
56	Participation in cultural/sports/co-curriculum activities	3.244	56	3.308	57	1	0.045	.777	N
57	Not Referring books/Depended only on class notes	3.209	57	3.538	48	9	0.233	.170	N
58	Students' Regular Counselling	3.163	58	3.442	53	5	0.197	.186	N
59	Percentages in English (12th Class) only	3.058	59	3.231	61	2	0.122	.468	N
60	Too much reliance on Teachers	3.000	60	2.904	67	7	0.068	.634	N
61	Caste Category (SC/ST/NT/OBC/GEN)	2.977	61	1.519	75	14	1.031	.000	Y
62	Examination Board (CG Board/CBSE/ICSE/Other)	2.965	62	2.962	65	3	0.002	.987	N
63	CGPET Score/Rank	2.965	63	3.692	44	19	0.514	.004	Y
64	Assignment submission/continuous assessment	2.953	64	3.481	52	12	0.373	.026	Y
65	Percentages in Maths (10th Class) only	2.919	65	3.250	59	6	0.234	.144	N
66	Father's Occupation	2.907	66	2.288	73	7	0.438	.014	Y
67	Living location/Location of School (Rural/Urban/Metro)	2.872	67	2.923	66	1	0.036	.834	N
68	No. of dependent on your parents/No. of siblings	2.744	68	2.673	69	1	0.050	.736	N
69	Father's Education	2.733	69	2.712	68	1	0.015	.930	N
70	Parents working (Only Father/Only Mother/Both)	2.709	70	2.423	72	2	0.202	.215	N
71	Mother's Education	2.698	71	2.519	70	1	0.127	.458	N
72	Aggregate Percentages of 12th Class	2.593	72	3.827	39	33	0.873	.000	Y
73	Mother's Occupation	2.593	73	2.000	74	1	0.419	.011	Y
74	Prefer to sit at Front/Back	2.395	74	2.442	71	3	0.033	.850	N
75	Aggregate Percentages of 10th Class	2.291	75	3.250	60	15	0.678	.000	Y

From Table II, it was observed that although, there were remarkable differences in rankings for some factors, overall amount of agreement between student and faculties' rankings was reasonable. The comparison of the students' and faculties' opinions on the importance of various factors responsible for student performances at university level can be observed in two different ways: i. The similarities in their responses suggest common understanding, and ii. The differences in their opinions suggest disagreement on the importance of the factors [5]. There were eight factors those were ranked very differently by the students and the faculties (rankings difference more than 20 places). These

factors are combined percentages in physics, chemistry & maths (12th Class), aggregate percentages of 12th class, family support, attendance percentages, financial condition of family, sincere preparation of class notes, lack of self-discipline, sufficient sleep. Out of these factors, combined percentages in physics, chemistry, maths (12th Class) and aggregate percentages of 12th class were ranked by the highest differences i.e. 33 places. For both the items faculties gave higher rank which means they gave more importance to the pre-admission academic achievement. Family support and attendance percentages were ranked by second highest differences i.e. 30 places. In this case, family support was given higher rank by the students but an attendance percentage was given higher rank by the faculties. This support that students gave more importance to the family support but faculties gave more importance to attendance percentages. Other factors, financial condition of family (27 places difference) and sufficient sleep (21 places difference), were given more importance by students whereas sincere preparation of class notes (25 places difference) and lack of self-discipline (22 places differences) were given more importance by faculties. Overall, out of above eight items, three items were given more importance by students and another five items were given more importance by faculties.

Self-study/regular study at home, family support, time management, numerical problem solving ability, teacher's support/appreciation/inspiration & help are the top five factors ranked by students while time management, self study/regular study at home, lack of self-discipline, numerical problem solving ability, sincere preparation of class notes are the top five factors ranked by the faculties. Out of these top five factors ranked by both, students and faculties, three factors are common i.e. self study/regular study at home, time management, and numerical problem solving ability. For these common factors the places difference is very small. This suggests that these common factors are most important factors which considerably affect students' performance in university examination. Out of these remaining factors, three factors i.e. self study, sincere preparation of class notes and lack of self-discipline are ranked by very large (more than 20 places) ranking difference. Teacher's support/appreciation/inspiration & help is ranked by ranking difference of 14 places.

One Way ANOVA were used to check the significance of the difference of the opinions between students and faculties. One way ANOVA compares the means of the samples or groups in order to make inferences about the population mean. It is also called single factor analysis of variance because there is only one independent variable or factor (Kothari, 204). Table 2 shows the results of one way ANOVA at 95 % confidence level for influencing factors. There was no significant difference found between the opinions of students and faculties for 59 factors out of 75 factors (i.e. 78.67 %).

TABLE III LIST OF FREQUENTLY USED PERFORMING FACTORS

S. No.	Dependent/Performance Factors	Stud Ave	Rank (by Stud)	Teach Ave	Rank (by Teach)	Rank Diff.	Std. Devi.	Signi. If $p<0.05$	Signi. Y/N
1	Pass or Fail	4.345	1	4.508	1	0	0.11	0.820	N
2	Aggregate Percentage in end Sem. (final) exam	4.245	2	4.333	3	1	0.06	0.601	N
3	No. of attempts taken to clear the semester	3.909	3	4.175	4	1	0.18	0.818	N
4	SPI/CPI (Sem./Cum. Performance Index) of end Sem. exam	3.891	4	4.397	2	2	0.36	0.016	Y
5	Percentages of Only Theory Subjects in end Sem. exam	3.691	5	4.095	5	0	0.29	0.112	N

From the above Table III, it was observed that pass/fail and aggregate percentage in end sem. (final) examination are top two performing factors ranked by students while pass/fail and SPI/CPI (sem./cum. performance index) of end sem. examination are top two performing factors ranked by faculties. There are not major rank-wise differences in opinions of both, students and faculties. Pass/fail factor was given first rank by both groups. Aggregate percentage in end semester (final) examination was given second rank by students and third rank by faculties. This suggests that pass/fail factor is the most important performing factor which can be used to measure the performance of engineering students in university examination. There is significant difference in opinion only for one performing factor i.e. SPI/CPI of end sem. examination.

IV. CONCLUSION

There were eight influencing factors those were ranked by the students and the faculties with large differences (rankings difference more than 20 places). Out of these eight factors, three factors i.e. family support, financial condition of family and sufficient sleep are given more importance by students and another five factors i.e. combined percentages in physics, chemistry & maths (12th Class), aggregate percentages of 12th class, attendance percentages, sincere preparation of class notes and lack of self-discipline are given more importance by faculties. The factors, those are given more importance by students, are related with their family and personal characteristics while the factors, those are given more importance by faculties, are related with their pre-academic and class room

environment. This indicates that students give more importance to personal and family factors and faculties give more importance to pre-academic and class room environment factors.

Out of the top ranked 5 factors by students and faculties independently, 3 factors are common. These factors are self study/regular study at home, time management, and numerical problem solving ability. This suggests that these common factors are the most important factors which considerably affect students' performance in university examination. If students pay proper attention on these factors, their probability of passing in the examination may increase. These three factors are the personal factors which indicate that the success of students mostly depends on their own efforts and capability.

There was no significant difference found between the opinions of students and faculties for 59 influencing factors out of 75 factors (i.e. 78.67 %). So it can be concluded that for most of the factors the students and faculties were having similar opinion. The significant difference for remaining 16 (i.e. 21.33 %) influencing factors may be due to differences in their perspective as students and faculties or generation gap between students and faculties.

Similarly for performing factors, pass/fail is a highest ranked common factor in both ranking, by students as well as by faculties. There is significant difference in opinion only for one performing factor i.e. SPI/CPI of end sem. examination. Faculties have given second rank while students have given fourth rank to this factor. This analysis is based on faculties' assumptions with students' perceptions about the factors that responsible for students' performances at university level and not on the measurement of actual data. These identified important influencing factors may be used further in the questionnaire to correlate students' actual performance with their influencing factors.

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