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IMPACT OF SCHOOL EDUCATION ON PERFORMANCE IN HIGHER EDUCATION (A STUDY ON ENGINEERING STUDENTS)

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Abstract - In the present scenario of dynamic growth in higher education, increasing drop out ratio in IITs has raised concern over the quality of education provided during high school (10+2) education. This study is influenced by a general observation that the efforts students put in 10+2 classes to reach their goal (short term) of getting admission into top rated engineering institutions of the country, they are not able to repeat it in college education. Impact of several factors due to the student's poor performance in higher education relative to their performance in high school education has been studied. This study was conducted among 144 engineering students of First and Second Year who have come from different regions of the country. The study was based on ranking approach, in which total 10 factors affecting the performance in higher education were identified. The ranking of these 10 factors was further analyzed through Graph analysis and Rank Correlation Coefficient. Factors such as Changed environment comparative to 12 years long school education, Complexities regarding syllabus and Pressure of entrance examinations in addition to board examinations, are emerged as the major factors affecting the student's performance in higher education.

Key Words - Higher Education, High School Education, Rank Correlation Coefficient

1. INTRODUCTION

India has observed dynamic changes in education during last decade when the policy of government to encourage private sector in higher education started showing its impact. These private higher educational institutions are providing a fair chance to all the students to pursue the course they want. India's higher education system is the third largest in the world, next to United States and China. Indian higher education system has expanded at a fast pace by adding nearly 20,000 colleges and more than 8 million students in a decade from 2000-01 to 2010-11. As per data available on UGC Website, currently, India has 44 central universities, 298 state universities, 130 deemed universities, 148 private universities, and 53 Institutes of National Importance. There were 20 Universities and 500 Colleges at the time of independence.

This growth brings many challenges to maintain quality standards in higher education. IITs are also affected due to getting poor quality students. Infosys chairman emeritus N R Narayan Murthy said, "The quality of students entering Indian Institutes of Technology (IITs) has deteriorated over the years due to the coaching classes that prepare engineering aspirants." Recently all IITs changed their Joint Entrance Examination (JEE) pattern and made score of 10+2 also a very important factor for entering into higher education. Government of India is also focusing on providing quality education at school level. Recently GOI allocated Rs. 65,867 crores has been allocated to the Ministry of Human Resource Development out of which Rs. 27, 258 crore is allocated for SSA (Sarva Shiksha Abhiyan) and RTE.

2. RESEARCH METHODOLOGY

2.1 Objectives and Hypothesis of the Study

The primary objective of this study is to investigate the factors based on 10+2 education that affect the students' performance in higher education. The objectives of the presented study are given below.

- To identify the major factors based on 10+2 that affect students' performance in higher education
- To identify the challenges that students face when they shift from school education to higher education
- To understand the 10+2 score and the impact of identified factors
- To identify the challenges that schools and colleges are required to meet to change this scenario.

Null Hypothesis H_0 : There is no correlation between the opinions of the group G1 and group G2 of the students ($r_s = 0$) where G1 is the students who scored more than 70% in 10+2 exam and G2 is the students who scored 70% or less in 10+2 exam.

2.2 Significance of the Study

The significance of this study is to help policy makers in educational institutions so that the students replicate or improve their performance in school education in higher education.

2.3 Study Design

The primary data is collected through a questionnaire that was distributed in 152 students studying in First and Second year of B. Tech. course. These students have come from various schools of different regions of the country. The reason of taking only first and second year students is based on the fact that the impact of school education will remain only till second year. The questionnaire was based on ranking approach, in which total 10 factors based on 10+2 education affecting the performance of a student in higher education were identified. These factors were based on literature survey and personal observation. These factors were also discussed with the academicians teaching these classes. The students were asked to rate these factors in view of their role in affecting their performance in higher education where, '1' represents most important and '10' represents least important factor. Total 8 of 152 respondents submitted incomplete and ambiguous questionnaire therefore the responses received from remaining 144 respondents were considered for the study. These 144 respondents are represented by R1 to R144 and the 10 factors are represented by F1 to F10 in the presented study. These students were also asked several questions such as time spent on tuitions during 10+2, major reasons they feel that are important other than given factor and their suggestions to the institutions to have their opinion for further qualitative analysis. The identified factors are given in table 3.1.

Table 2.1 – List of Factors

Code	Factors
F1	Overload in 10+2 educational examinations
F2	Pressure of entrance examinations in addition to board examinations
F3	Tuitions / Coaching during 12th class whereas this is not available (in general) during higher educations
F4	Changed environment comparative to 12 years long school education
F5	Chosen the study in which you were not interested
F6	Complexities regarding syllabus
F7	Risen expectations from parents
F8	Language (in case of change of medium of instruction)
F9	Increased load in first semester/first year itself)
F10	Unwillingness towards studies due to personal reasons

3. LITERATURE REVIEW

There have been many studies on the status of higher education in India in the form of research papers, case studies and reports of various private and public institutions.

The progress of school education in India was studied by Geeta Gandhi Kingdon [1]. She concluded that India does well relative to Pakistan and Bangladesh but lags seriously behind China and the other BRIC countries, especially in secondary school participation and youth literacy rates. DW report [2] on education - Bad grades for India's schools says that India's highly-qualified computer scientists, engineers and doctors impress many in the world. But they are the exceptions. India's schools are underfunded, and the country has the world's highest illiteracy rate.

Sanat Kaul [3] writes that over the last 50 years, the Government of India has provided full policy support and substantial public funds to create one of the world's largest systems of higher education. These institutions, with the exception of some notable ones, have however, not been able to maintain the high standards of education or keep pace with developments in the fields especially in knowledge and technology. She further concluded that over time, financial constraints with exploding enrolments, and a very high demand from primary and secondary education has led to the deterioration in the financial support provided by the government. In terms of higher education, however, on the science and technology side, India has however built up the largest stock of scientists, engineers and technicians. Deepti Gupta and Navneet Gupta [4] investigated into the development and present scenario of higher education in India by analyzing the various data and also identify the key challenges that India's higher education

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sector is facing. The key initiatives by the government and recommendations to meet these challenges were also highlighted into this study.

M. B. Hiremath, *et.al.* [5] presented results of an analysis of higher education and research scenario in ten state universities of India during 2000 to 2006. Shivani and Shashi Khurana [6] have concluded that concept of technical education system and some useful insights on the underlying philosophy, policies, choices and rationale, which have helped to shape the systems of technical education and training in India.

A report on Status of Education in India by National University of Educational Planning and Administration [7] highlights that Quality improvement in Schools is a centrally sponsored scheme and is an amalgamation of the schemes of improvement in Science Education, Mathematics Olympiads, Environment Orientation, Promotion of Yoga and Population Education and has a new component of Educational Libraries. The report writes that under this scheme, State Governments and registered societies are given grants for the specified activities under each of the erstwhile programme. Ruby and David [8] worked on prediction of student academic performance using various classification algorithms. This paper helps the institution to know the academic status of the students in advance and can concentrate on weak students to improve their academic results.

A thorough search into various articles available online suggested that there is lot of scope to study into the impact of high school education on higher technical education. The presented idea is to explore the weak points where both the high school educational and higher educational institutes need to improve to reach quality education standards.

4. DATA ANALYSIS AND FINDINGS

Three types of analysis have been adopted to study the identified factors. In first analysis, the data as a whole for all the respondents (faculty members) have been analyzed and then further in the second analysis, the correlation has been discussed by dividing the faculty members in two groups based on their total years of experience. Third analysis has been done on the opinion of the management of an institution on faculty retention.

Analysis 1

Table 4.1 represents the factor wise percentage of total respondents who ranked the given factors from '1' to '10'.

Table 4.1 - Factor Wise Percentage of Total Respondents

RANK	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	Maximum	
1	12	17.1	5.56	28.1	14.7	12.1	13.8	12.6	11.9	16	28.06	F4
2	9.77	12.4	8.73	18.7	10.1	12.9	13.1	3.94	9.7	7.63	18.71	F4
3	9.02	10.9	11.9	11.5	6.98	15.9	12.3	3.15	10.4	7.63	15.91	F10
4	5.26	11.6	11.9	12.2	5.43	7.58	6.92	5.51	11.9	9.92	12.23	F4
5	17.3	10.9	8.73	3.6	8.53	22.7	11.5	8.66	11.2	6.11	22.73	F6
6	13.5	6.98	8.73	4.32	8.53	8.33	11.5	2.36	6.72	3.05	13.53	F1
7	10.5	3.88	11.9	4.32	10.1	6.06	8.46	5.51	6.72	9.92	11.9	F3
8	8.27	9.3	15.1	6.47	8.53	7.58	8.46	8.66	8.96	5.34	15.08	F3
9	3.76	6.2	5.56	5.04	6.98	3.03	1.54	12.6	7.46	14.5	14.5	F10
10	10.5	10.9	11.9	5.76	20.2	3.79	12.3	37	14.9	19.8	37.01	F8

The factor wise critical analysis shows that maximum 28.06 percent of total respondents think that Changed environment comparative to 12 years long school education (F4) is the most important factor affecting their performance when they enter into higher education. Interestingly, 18.71 percent of respondents consider the same factor as second most important that means approximate 45% respondent consider that this factor plays an important role in their performance. 37% respondents think that language (change of medium of instruction) does not affect their performance.

Analysis 2

The Faculty Members were divided into two groups based on their total experience:

G1: The students scored more than 70% in 10+2 Exams

G2: The students scored 70% or below in 10+2 Exams

Null Hypothesis H_0 : There is no correlation between the opinions of both the groups ($r_s = 0$)

Table 4.2 - Factor Wise Percentage of Total Respondents

Factor	Average Rank (>70%)	R_i	Average Rank (<=70%)	S_i	$R_i S_i$
F1	5.47	5	5	3	15
F2	4.51	3	5.23	5	15
F3	5.97	7	5.48	8	56
F4	3.69	1	3.89	1	1
F5	6.04	9	5.38	6	54
F6	4.38	2	4.6	2	4
F7	4.62	4	5.39	7	28
F8	7.07	10	6.93	10	100
F9	5.62	6	5.17	4	24
F10	6.03	8	5.6	9	72

Using Table 4.2,

$$r_s = \frac{\sum_{i=1}^{10} R_i S_i - n(n+1)^2/4}{n(n^2-1)/12} = 0.81; t = r_s \sqrt{\frac{n-2}{1-r_s^2}} = 0.81 \sqrt{\frac{10-2}{1-(0.81)^2}} = 3.91$$

Since the calculated value of t is significantly large therefore we reject the null hypothesis, meaning there is a significant correlation between the opinions of both the groups of students. Factor wise analysis is also shown in Figure 1.

Fig. 4.1 is also showing that the opinions of both the groups have significant correlation, however, in case of factor wise analysis it is observed that there is some difference of opinion for 'Chosen the study in which you were not interested (F5)' has been given more priority by the students belonging to G2 relative to G1. Similar trend was observed for 'Tutions / Coaching during 12th class whereas this is not available (in general) during higher educations (F3)' and 'Unwillingness towards studies due to personal reasons (F10)'. Reverse phenomenon has been observed in case of 'Pressure of entrance examinations in addition to board examinations (F2)' and 'Risen expectations from parents (F7)' where students from G1 have given more priority relative to G2.

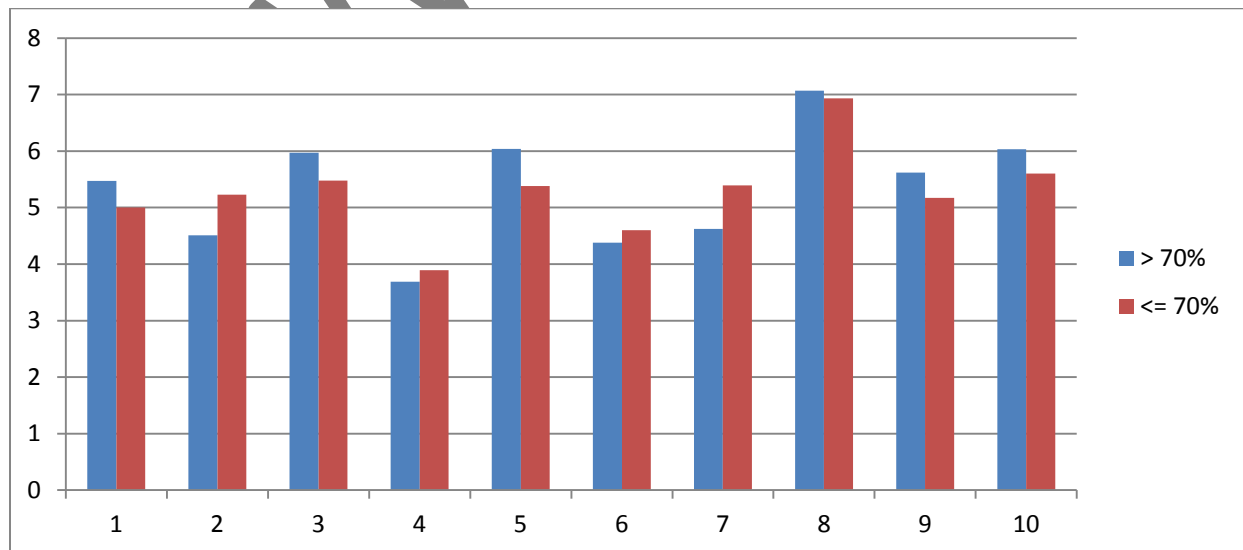


Fig. 4.1: Factor wise priority chart for G1 and G2

Analysis 3

Text inputs received from students have clearly shown that the performance of students is mostly affected by changed environment and complexity in syllabuses during higher education. It has been observed that students take time in adjusting themselves in new system. This lead time harms their performance in first semester itself and most of them take a year for repairing these further losses. It has also been observed that faculty crisis in higher education also affect the students' performance as they do not get necessary and consistent support or guidance that they require from faculty members.

Most of the students take the support of tuition and coaching centers to pass the course and for preparing for engineering entrance examinations, whereas, they do not get the same in higher education. This is not possible due to the facts that they do not get sufficient time for the same and the increasing number of courses comparative to 10+2 where they study majorly three subjects.

CONCLUSION

Changed environment comparative to 12 years long school education and Complexities regarding syllabus are the key factors influence the performance of a student in higher education. It is also concluded that there is a sufficient correlation in the opinions of the students who scored more than 70% and the students who scored 70% or below marks in 10+2. The independent students' opinion is also on the same line that these two factors influence their performance a lot in addition to the current faculty crisis in the higher educational Institutions.

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