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# "A study showing the correlation between parameters affecting the undergraduate engineering education: students' perspective"

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## ABSTRACT

The objective of the study is to find out the correlation between parameters affecting the undergraduate engineering education with respect to students' perspective in a private technical institution in NCR, Haryana. 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. For data analysis and conclusion of the results of the survey, statistical tool like Correlation was performed on MS Excel. From the results we can infer the following: Firstly "selection process" is negligibly impactive factor on "academic excellence", "infrastructure", "personality development & industry exposure", "placements" and "management & administration". Secondly "academic excellence" is negligibly impactive factor on "infrastructure", "placements" and "management & administration". While "academic excellence" is poorly impactive factor on "personality development & industry exposure". Thirdly "infrastructure" is negligibly impactive factor on "personality development & industry exposure", "placements" and "management & administration". Fourthly "personality development & industry exposure" is poorly impactive factor on "placements" and negligibly impactive factor on "management & administration". And lastly "placements" is negligibly impactive factor on "management & administration".

## INTRODUCTION

Education is vital to the human resources development and empowerment in the stages of growth of a nation. In any education system, higher education encompassing Management, Engineering, Medicines etc., plays a major role in imparting knowledge, values, and developing skills and, in the process, increase the growth and productivity of the nation. While the Government is committed to providing primary education and certain facilities/subsidies for higher education, given the higher cost involved in the establishment of higher education institutes, we are witnessing the entry of private sector to run educational institutions.

The famous philosopher Einstein while discussing the need for education has projected the following fundamentals:

a. To educate the individual as a free individual; to understand and use critical thinking skills.

b. To educate the individual as a part of society – virtually all our knowledge, our clothes, our food is produced by others in our society, thus, we owe Society and have responsibility to contribute back to Society.

c. Through education, knowledge must continually be renewed by ceaseless effort, if it is not to be lost. It resembles a statute of marble which stands in the desert and is continually threatened with burial by the shifting sand. The hands of service must ever be at work, in order that the marble continue to lastingly shine in the sun.

Schools have become the most important means of transforming wealth of knowledge and skills from one generation to another. However, the role of institutions becomes more challenging in the modern world with innovations and technological developments. Investment in education and educational institutions should be viewed as an investment for economic prosperity.

### 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

Dr. Sunil Kumar Sain and Sudhir Sudam Kaware (2013) the study addresses the ways in which India is trying to improve the quality of technical education for all students in the country and provide wide access to such education through technology mediated learning. It was an evaluative study which was based on the secondary sources of data. The study concluded that various kinds and generations of technology will continue to evolve and serve as prime enabling factors in dissemination of instructional material as well as providing for interaction between students and teachers separated by geographical distance.

Venkata Subrahmanyam and Dr. K. Ravichandran (2013) the study deals with the current state of distance education in India; scope and market for the online courses; various methods of course offerings; how I.T. infrastructure can be used to its BEST in order to radicalize the lesson delivery; what kind of developments can be brought-in in the conduct / offering of online courses, etc. issues briefly and suggests various solutions to most of the common and current problems being faced. It was an evaluative study which was based on the secondary sources of the data. The study concluded that Universities or Institutions offering online distance learning can give up the conventional methods and can take up the hybrid learning as a tool in their course offerings in order to get the best results. Though, on outset, implementation of hybrid learning appears costly, costs can easily be recovered and can easily reach break evens in a short time.

Dr. S. V. Sant (2013) the objectives of the study were as follows: to study the concept of vocational education(VE), to review the current scenario of vocational education in India, to study the role of Government in developing VE, and to identify the problem areas and give suggestions to strengthen VE in India. It was a descriptive research which was based on the secondary data sources. The data has been collected from reference books, journals, periodicals, and research papers. The study concluded that it is necessary to reorient and redesign the curricula of VE to instill in students and trainees the basic skills along with problem solving, cognitive digital literacy skills, respect for conservation and sustainable use of resources and the competencies to practice sustainable tasks at the workplace of today and tomorrow. The proper framework, planning, policy and the support from government and all stake holders is essential for successful implementation of VE system.

Vikas Sitaram Chomal and Dr. Jatinder Kumar R. Saini (2013) it focuses on the impressive transformation which has taken place in paradigm shift of education in recent years, owing to use of technology. It was an evaluative study which was based on the secondary sources of the data. The author has laid down various findings from the literature review. The study concluded that the introduction of new information technology in teaching and learning has impacted the traditional classroom activities. The various technologies produce a greater level of interaction between and among teachers and students. They also help to improve the educational environment while providing enrichment in the learning experience.

Atasi Mohanty (2012) the study emphasis that in 21st century diversity has affected nearly every aspect of education such as access and equity, teaching methods and student learning, quality, management, research priorities, social relevance, autonomy, finance etc. The author has used the descriptive method as well as analytical, based on the analysis of secondary data. The study concluded that our colleges and universities must review their mission statements, planning documents, assessment procedures, and budgets to ensure that quality and diversity are constructed as genuinely central to academic excellence. In a number of ways students' learning engagements/ process outcomes and performance/ learning outcomes are enhanced by increasing critical thinking, problem-solving ability and sense of social responsibility. However, more attention is needed to be given on the aspects like the benefits of recruiting diverse faculty in enhancing teaching-learning effectiveness, pedagogical implications, interdisciplinary research and developing multiple abilities like cross-cultural, leadership and technical competencies amongst our university students. But all these issues should go along with the institutions' goals and budget. Moreover, the universities/colleges in the new millennium are facing numerous complex challenges like how to structure their programs for enhancing the flexibility and responsiveness in fulfilling students' expectations and demands from the job market, as well as maintaining the quality and brand name. Thus, our educational institutions need to revisit and redefine their missions and visions in the light of new challenges of globalization and clearly specify how to address this diversity issue. They must chalk out how diversity is defined, valued, measured, incorporated into planning, execution and evaluation process and leveraged by their institute in order to sustain in the global competition.

Sunil Mani & Arun M (2012) the study emphasis that enrolments in engineering has increased from about 2800 in 1991 to about 28,000 in 2008. The study analyses whether this increase in potential supply of engineers has resulted in actual supply of engineers. The author has used the descriptive method as well as

analytical, based on the analysis of secondary data. The study concluded that liberalisation of education has not brought in the expected benefits. It is clear that many students who gain admission to engineering colleges do not have the basic capability, which can be built only by improving school education.

Neal Callahan, Martin Jones and Richard Bruce (2012) the study reports findings concerning the current and future prospects for online education and the established best practices in online education at the post-secondary level. A survey of faculty in technology-based programs was developed in order to compare faculty perceptions of online education with respect to the critical success factors identified by the four organizations. The survey was administered via SurveyMonkey.com, and members from the Association of Technology, Management, and Applied Engineering's (ATMAE) university and professional members were invited to participate in the survey. There were a total of 80 members who began the survey. The study concluded that online delivery of courses and programs has become a significant factor in post-secondary education. Online education offers great advantages in convenience and flexibility that can clearly improve accessibility for students in a variety of situations.

Harmanpreet Singh Sandhu and Daviet (2012) the study seeks to address the following research question to particular strata of students belonging to technological background: "What is the engineering student's attitude towards use of open access resources?". The study presents the results of a survey that assessed engineering student's familiarity with use of open access resources in Punjab (India). The survey was made through questionnaires and completed by 460 respondents. Respondents were generally familiar with open access sources including open access journals, institutional repositories and self-archived materials on the web. The study concluded that the results indicate the needs for increased awareness that open access are valuable and qualitative source of information. Respondents' generally have positive attitudes toward open access which indicates that many students support open access materials and might therefore be more likely to encourage others to publish in them.

P. Geetha Rani (2010) the study made an attempt to look at the changing dynamics of higher education, using engineering education in Tamil Nadu as a case of reference. The study concluded that it is important to regulate market through both short-term and long-term policies. In the short run, it needs to focus on ensuring quality and accountability of the private higher education system immediately. In the long run, the 'state' should raise some fundamental and forgotten intrinsic values such as positive externalities, the social purpose that higher education serves, the nation building role it performs, the public good and the human right natures of higher education are to be brought back.

Sanjay Mishra (2010) the study examines some internationally renowned educational institutions that are embracing the growing importance of non-technical subjects and soft skills in 21st century engineering curricula. The study concluded that some 'out of the box' thinking is required to synergise technical and nontechnical content to meet society's new requirements. India has seen sporadic curricula reforms, most Indian engineering institutions are falling behind. This is not necessarily due to a lack of awareness but more to administrative set-up, over centralised academic power, and rigid regulations that hinder innovative academic practices and student learning.

Vandana Saxena, Sanjay Kulsrestha and Bali Khan (2010) the study deals with the expanding scope of higher education in a developing country like India. Research carried out in a country or a society is governed by its imperatives. Another factor that governs research is the general psychological makeup of a country. The author has used the descriptive method as well as analytical, based on the analysis of secondary data. The study concluded that Universities in India can sign memorandum of understanding (MoU) with foreign universities for scientific research. Some universities and institutions do have research collaborations with foreign countries. Once this process sets in, serious research scholars would be drawn towards scientific research in different areas.

Salma Khan and J. Dominic (2009) the objectives of the study were as follows: to analyze the patterns of Internet use, the Internet skills of the professionals, the perceived impact of the Internet on their academic efficiency and problems faced by them in using the Internet. A detailed questionnaire was designed and circulated among the 50 teachers of CET & MIT. The study concluded that use of conventional document is decreasing and dependency on Internet is increasing. It expedites the research process and also improves the professional competency. The following are the findings of the study: 1. Majority of the faculty members of MIT are using Internet for less than 6 months whereas the entire faculty members of CET are using it for more then 6 months, and the majority of the respondents are using it for more than 4 years. 2. Majority of the CET respondents, i.e. 75 percent are using it daily, and 55 per cent of MIT are using it 2-3 times a week. 3. Most of the faculty members of CET are using Internet for more than 20 hours a week whereas majority of MIT respondent are using for less than 1 hour a week. 4. Majority of users of both the colleges are using Internet at work place. 5. Majority of the respondent of MIT learns Internet skills from colleagues and friends and training from college, CET respondent learns from self instructions. 6. Majority of CET faculty is using Internet for research purpose whereas MIT respondent use it for education. 7. Most of the respondent use www service and next is e-mail service. 8. Respondent of both the college faces the problem of slow Internet access speed and too long to view /download pages. 9. Search engine is use for browsing information from the Internet. 10. All are of the view that Internet is more informative, timesaving and useful. 11. Majority of the respondent are in favour that use of conventional document will decrease. 12. Most of the respondent of MIT are least satisfied with the speed where as only 50 per cent of the CET respondent are least satisfied. 13. Only 50 per cent of the respondents of CET are in favour of that internet can replace library and only 20 per cent of MIT respondent believe that it cannot replace library. 14. Majority favour that internet can replace library.

**RESEARCH METHODOLOGY**

Objective of the study: The objective of the study is to find out the correlation between parameters affecting the undergraduate engineering education with respect to students' perspective 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 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 a private technical educational institution in NCR. The respondents are the students pursuing B.Tech who were selected randomly from the above said geographical area.

Statistical tools to be used: For data analysis and conclusion of the results of the survey, statistical tool like Correlation was performed on MS Excel.

**DATA ANALYSIS AND INTERPRETATIONS**

**CORRELATION**

**Table 1: Showing the coefficient of correlation (r) for the parameters**

| | | Coefficient of Correlation (r) |
|---|---|---|
| Selection Process vis-à-vis other parameters | Academic Excellence | 0.622 |
| | Infrastructure | 0.467 |
| | Personality Development & Industry Exposure | 0.563 |
| | Placements | 0.482 |
| | Management & Administration | 0.494 |
| Academic Excellence vis-à-vis other parameters | Infrastructure | 0.59 |
| | Personality Development & Industry Exposure | 0.709 |
| | Placements | 0.533 |
| | Management & Administration | 0.575 |
| Infrastructure vis-à-vis other parameters | Personality Development & Industry Exposure | 0.631 |
| | Placements | 0.537 |
| | Management & Administration | 0.628 |
| Personality Development and Industry Exposure vis-à-vis other parameters | Placements | 0.663 |
| | Management & Administration | 0.64 |
| Placements vis-à-vis other parameters | Management & Administration | 0.545 |

**Interpretations:**

- Selection Process vis-à-vis Academic Excellence: The correlation coefficient between the two variables is 0.622. It means that the "selection process" and "academic excellence" are found to be positively correlated. As $0<r\leq0.6$, we can infer that there is a very weak correlation between the two variables i.e. the cloud (scatter) of points is away from the straight line. We can infer that "selection process" is negligibly impactive factor on "academic excellence".
- Selection Process vis-à-vis Infrastructure: The correlation coefficient between the two variables is 0.467. It means that the "selection process" and "infrastructure" are found to be positively correlated. As $0<r\leq0.6$, we can infer that there is a very weak correlation between the two variables i.e. the cloud (scatter) of points is away from the straight line. We can infer that "selection process" is negligibly impactive factor on "infrastructure".
- Selection Process vis-à-vis Personality Development and Industry Exposure: The correlation coefficient between the two variables is 0.563. It means that the "selection process" and "personality development and industry exposure" are found to be positively correlated. As $0<r\leq0.6$, we can infer that there is a very weak correlation between the two variables i.e. the cloud (scatter) of points is away from the straight line. We can infer that "selection process" is negligibly impactive factor on "personality development & industry exposure".
- Selection Process vis-à-vis Placements: The correlation coefficient between the two variables is 0.482. It means that the "selection process" and "placements" are found to be positively correlated. As $0<r\leq0.6$, we can infer that there is a very weak correlation between the two variables i.e. the

cloud (scatter) of points is away from the straight line. We can infer that "selection process" is negligibly impactive factor on "placements".

- Selection Process vis-à-vis Management and Administration: The correlation coefficient between the two variables is 0.494. It means that the "selection process" and "management and administration" are found to be positively correlated. As $0<r\leq0.6$, we can infer that there is a very weak correlation between the two variables i.e. the cloud (scatter) of points is away from the straight line. We can infer that "selection process" is negligibly impactive factor on "management & administration".
- Academic Excellence vis-à-vis Infrastructure: The correlation coefficient between the two variables is 0.59. It means that the "academic excellence" and "infrastructure" are found to be positively correlated. As $0<r\leq0.6$, we can infer that there is a very weak correlation between the two variables i.e. the cloud (scatter) of points is away from the straight line. We can infer that "academic excellence" is negligibly impactive factor on "infrastructure".
- Academic Excellence vis-à-vis Personality Development and Industry Exposure: The correlation coefficient between the two variables is 0.709. It means that the "academic excellence" and "personality development and industry exposure" are found to be positively correlated. As $0.65<r\leq0.75$, we can infer that there is a weak correlation between the two variables i.e. the cloud (scatter) of points is not closed to a straight line. We can infer that "academic excellence" is poorlimpactive factor on "personality development & industry exposure".
- Academic Excellence vis-à-vis Placements: The correlation coefficient between the two variables is 0.533. It means that the "academic excellence" and "placements" are found to be positively correlated. As $0<r\leq0.6$, we can infer that there is a very weak correlation between the two variables i.e. the cloud (scatter) of points is away from the straight line. We can infer that "academic excellence" is negligibly impactive factor on "placements".
- Academic Excellence vis-à-vis Management and Administration: The correlation coefficient between the two variables is 0.575. It means that the "academic excellence" and "management and administration" are found to be positively correlated. As $0<r\leq0.6$, we can infer that there is a very weak correlation between the two variables i.e. the cloud (scatter) of points is away from the straight line. We can infer that "academic excellence" is negligibly impactive factor on "management & administration".
- Infrastructure vis-à-vis Personality Development and Industry Exposure: The correlation coefficient between the two variables is 0.631. It means that the "infrastructure" and "personality development and industry exposure" are found to be positively correlated. As $0<r\leq0.6$, we can infer that there is a very weak correlation between the two variables i.e. the cloud (scatter) of points is away from the straight line. We can infer that "infrastructure" is negligibly impactive factor on "personality development & industry exposure".
- Infrastructure vis-à-vis Placements: The correlation coefficient between the two variables is 0.537. It means that the "infrastructure" and "placements" are found to be positively correlated. As $0<r\leq0.6$, we can infer that there is a very weak correlation between the two variables i.e. the cloud (scatter) of points is away from the straight line. We can infer that "infrastructure" is negligibly impactive factor on "placements".
- Infrastructure vis-à-vis Management and Administration: The correlation coefficient between the two variables is 0.628. It means that the "infrastructure" and "management and administration" are found to be positively correlated. As $0<r\leq0.6$, we can infer that there is a very weak correlation between the two variables i.e. the cloud (scatter) of points is away from the straight line. We can infer that "infrastructure" is negligibly impactive factor on "management & administration".
- Personality Development and Industry Exposure vis-à-vis Placements: The correlation coefficient between the two variables is 0.663. It means that the "personality development and industry exposure" and "placements" are found to be positively correlated. As $0.65<r\leq0.75$, we can infer that there is a weak correlation between the two variables i.e. the cloud (scatter) of points is not closed to a straight line. We can infer that "personality development & industry exposure" is poorly impactive factor on "placements".

- Personality Development and Industry Exposure vis-à-vis Management and Administration: The correlation coefficient between the two variables is 0.64. It means that the "personality development and industry exposure" and "management and administration" are found to be positively correlated. As $0<r\leq0.6$, we can infer that there is a very weak correlation between the two variables i.e. the cloud (scatter) of points is away from the straight line. We can infer that "personality development & industry exposure" is negligibly impactive factor on "management & administration".
- Placements vis-à-vis Management and Administration: The correlation coefficient between the two variables is 0.545. It means that the "placements" and "management and administration" are found to be positively correlated. As $0<r\leq0.6$, we can infer that there is a very weak correlation between the two variables i.e. the cloud (scatter) of points is away from the straight line. We can infer that "placements" is negligibly impactive factor on "management & administration".

## CONCLUSIONS

From the results we can infer the following: Firstly "selection process" is negligibly impactive factor on "academic excellence", "infrastructure", "personality development & industry exposure", "placements" and "management & administration". Secondly "academic excellence" is negligibly impactive factor on "infrastructure", "placements" and "management & administration". While "academic excellence" is poorly impactive factor on "personality development & industry exposure". Thirdly "infrastructure" is negligibly impactive factor on "personality development & industry exposure", "placements" and "management & administration". Fourthly "personality development & industry exposure" is poorly impactive factor on "placements" and negligibly impactive factor on "management & administration". And lastly "placements" is negligibly impactive factor on "management & administration".

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