

Factors Influencing the Aspirations of First Year Engineering Students: A Statistical Study

Ajinkya S. Joshi, Pramod K. Shahabadkar, Keshav N. Nandurkar and Dnyaneshwaree S. Jawale.
Department of Management Studies, K. K. Wagh Institute of Engineering Education and Research,
Maharashtra, India.

Abstract—An engineering student passing out from the college has different aspirations such as obtaining a job through campus interview, opting for higher education in India and abroad, becoming an entrepreneur and so on. A study was conducted in the past to understand the aspirations of the undergraduate students. The current study is an attempt to identify the factors that influence the student aspirations. A study in this connection was carried out in an Engineering College located in the western part of India. The objective of this paper is to determine the factors influencing the aspirations of engineering students. Nine factors influencing the student aspirations were identified from the findings of the previous study and additional six factors were identified through a brainstorming session with the faculty members and students. A Google form was created to identify the prominent factors influencing the student aspirations. This form was circulated to 450 students and responses were obtained from 286 students over a period of one month. Multiple Linear Regression analysis was used to identify the most significant factors that influenced the student aspirations. Results indicate that seven factors namely annual family income, peer motivation, chances of fulfillment of aspirations, government policies, current academic marks, opportunities provided by institute and marks in CET exam are the most influential shaping the student aspirations. The outcome of this study will help the educational institutions to channelize their efforts, develop suitable mechanisms and help the students in fulfilling their aspirations.

Keywords- Employability; Engineering Graduates; Enrollment Ratio; Stakeholders; Student Aspirations; Technical Skills.

JEET Category—Research

I. INTRODUCTION

ASPIRATION can be defined as the ability of any individual to identify, define, set targets and work accordingly (Alam and Zahoor, 2021). Quaglia and Cobb (1996) defines aspirations as the ability of the student to identify and set goals for the future, while working toward the goals in the present.

It has been observed that students having either high expectations or aspirations exhibit higher achievements (Khattab, 2015). Aspirations are strong desires and hopes of achieving something which refers to identifying and setting goals for the future determined by a present inspiration for work to attaining the goals (Quaglia and Casey, 1996). Career aspirations are something that an individual wants to become while entering into professional life. These aspirations are shaped early in a student's life, but are modified over a period by experiences, challenges and environment surrounding them. The career aspirations have a tendency to evolve as one matures in response to their growing understanding of the world and what is possible by previous choices and achievements (Gutman and Akerman, 2008).

Recently a study was undertaken to determine the aspirations of the undergraduate engineering students (Shahabadkar et. al., 2021). The current study is a logical extension of this work and is an attempt to identify the factors that influence the student aspirations.

II. LITERATURE REVIEW

A study was undertaken to explore the effect of gender on the aspirations of the medical students (Drinkwater et. al, 2008). Researchers have pointed out a change in the gender balance in the UK medical school. The data were collected from 394 students of third year and 427 students of fourth year. The main aspiration of the respondents was to balance work and family life. Rather than achieving any specific career goal, the respondents aspired to make a difference in the lives of the people. The respondents however were ready to give up the responsibilities if their family was suffering or personal happiness was compromised. Researchers found a striking difference between the male and female respondents in the manner in which they planned to address their tensions between main aspirations.

Khattab (2015) examined how the combination of expectations, aspirations and achievements can influence the educational behavior of the students. The study revealed that students having high aspirations or expectations exhibit a higher achievement as compared to the students with low aspirations and expectations. Eight categories were created when the three

variables namely educational aspirations, expectations and achievements were cross tabulated. The data were analyzed using regression analysis and results suggested that both aspirations and expectations should be considered while examining the performance. The achievement may still be positively influenced even if any one of the factors i.e. aspiration or expectation is high. The researcher also points out that parental expectations also contribute to the achievements and educational behavior.

Tang et. al. (2008) examined the factors influencing the career aspirations of high school students. Researchers used a Social Cognitive Career Development model to examine relationships between various factors. A questionnaire was prepared and responses were obtained from 141 freshmen and sophomores which included eighty one females and sixty male students. Results indicated that the female students exhibited higher efficacy on occupations, opted for occupations that involve helping others, and more desire for internal rewards. The career self-efficacy was also found to be strongly related to career interests across genders. The study highlights the importance of self-efficacy, learning experience, interests and outcome expectations in the career development process of high school students.

Gale et. al. (2013) presented a report about aspirations on higher education of about 250 students from 14 government schools located in Central Queensland, Australia. According to the report 67% of the school students aspire to obtain a University degree in future. Female students however displayed higher levels of aspiration and navigational capacities for higher education. Many of the students who aspire to obtain a University degree are not clear about what they will study or which University they will attend. About 84% of the student decisions were influenced by their parents. The authors thus opine that the University outreach programs need to concentrate their energies not just on individuals or student groups but rather on their families and socio-cultural groups.

Much of the work undertaken by the researchers in the past focused on determining the aspirations or identifying factors influencing aspirations of the high school students. In contrast, the present study is an attempt to identify the factors that influence the student aspirations of undergraduate engineering students. Identification of such factors will help the technical institutions to concentrate their efforts in the right direction towards fulfilling student aspirations.

III. OBJECTIVES OF STUDY

Survival and growth of any institute depends upon how best the institute helps its students in fulfilling their aspirations. Based on the internal discussions carried out in the institute, it was felt necessary to identify factors that influenced the student aspirations and thereby develop a mechanism to help them to fulfill their aspirations. The study was carried out in a well-known engineering institute located in the western part of Maharashtra, India with the following objectives:

- To identify factors influencing the students in deciding their aspirations
- To determine the relationship among identified factors by using regression analysis
- To order and rank the factors influencing the students aspirations using statistical tools

IV. METHODOLOGY

In the past researchers had employed IT tools like Google sheets and Google forms for collecting the data from the students (Shahabdkar et. al., 2019; Lele et. al., 2021). These tools helped the researchers to collect the data in a quick and impartial manner. A similar process was adopted and the opinion of the participants was collected using Google forms over a period of one month from the third year engineering students. This form was circulated to 450 students and responses were obtained from 286 students which included 175 males and 111 females. This Google form consisted of a structured questionnaire consisting of few open ended and closed ended questions.

The Multiple Linear Regression Analysis was performed to ascertain the factors influencing the aspiration of engineering students. The 'aspiration of the student' was considered as the dependent variable for the analysis. The 15 factors influencing the aspiration of engineering students are considered as independent variables for the analysis. The dependent and independent variables identified are shown in table 1.

TABLE I
LIST OF VARIABLES FOR MULTIPLE LINEAR REGRESSION ANALYSIS

Dependent Variable	Independent Variables	
Aspirations of the student	• Family background	• Government policies
	• Annual family income	• Current academic marks
	• Native place	• Opportunities provided by institutes
	• Peer motivation	• Academic performance in SSC
	• Peer perception about aspiration	• Academic performance in HSC
	• Institutional activities	• Marks obtained in CET
	• Success stories of seniors	• Marks obtained in JEE
• Chances of the fulfillment of aspirations		

V. RESULTS AND DISCUSSION

The result of the Multiple Linear Regression Analysis indicated that out of 15 factors, family income, peer motivation, chances of fulfillment of aspirations, government policies, academic marks, opportunities provided by the institute and marks obtained in CET are statistically significant as their p-values are less than 0.05. These factors are shown in figure 1. The p-values for these factors have been shown in table 2.

TABLE II
SIGNIFICANT FACTORS INFLUENCING STUDENT ASPIRATIONS

Significant independent variables	p-value	Factor relevance
Annual family income	0.03354	Moderate Evidence
Peer motivation	0.026308	Moderate Evidence
Chances of fulfillment of aspirations	0.02679	Moderate Evidence
Government policies	0.010054	Strong Evidence
Current academic marks	0.030369	Moderate Evidence
Opportunities provided by institute	0.010862	Strong Evidence
Marks in CET	0.023265	Moderate Evidence

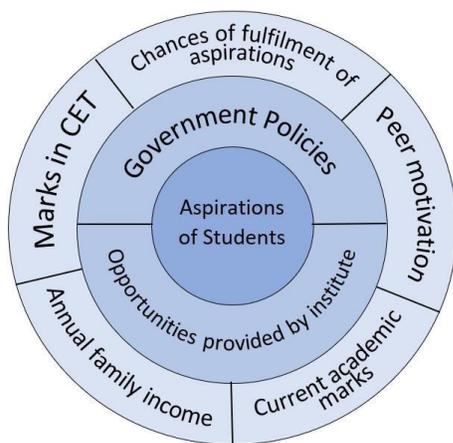


Fig. 1. Significant factors influencing the student aspirations

Figure 2 gives an overview of the relevant factors influencing the student aspirations. Two factors namely Government policies and Opportunities provided by the institute show strong evidence as compared to the other five factors.

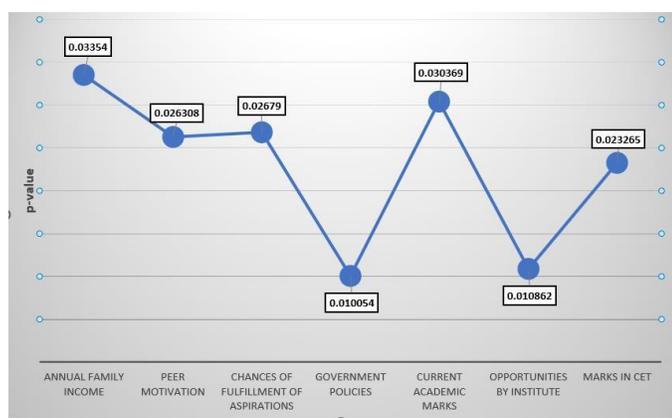


Fig. 2. p-values for significant factors influencing student aspirations

The aspirations of the students include obtaining a good placement in industry, higher education in reputed institutes abroad, higher education in reputed institutes in India, joining civil services and entrepreneurship. The percentage analysis was also carried out based on the family background of the students. It has been observed that the majority of the students aspired to obtain a good placement in industry irrespective of their family background. This analysis is shown in table 3.

TABLE III
ANALYSIS OF STUDENT ASPIRATIONS BASED ON FAMILY BACKGROUND

Family background	Aspirations of engineering students	Percentage
Working as a farmer	Obtaining a good placement in industry	93.24%
	Higher education in reputed institute abroad	2.70%
	Higher education in reputed institute in India	2.70%
	Joining civil services	1.36%
Working in government organization	Obtaining a good placement in industry	82.62%
	Higher education in reputed institute abroad	2.17%
	Higher education in reputed institute in India	6.52%
	Entrepreneurship	2.17%
Working in private organization	Joining civil services	6.52%
	Obtaining a good placement in industry	78.38%
	Higher education in reputed institute abroad	8.11%
	Higher education in reputed institute in India	10.81%
Owning a business	Joining civil services	2.70%
	Obtaining a good placement in industry	82.77%
	Higher Education in reputed institute abroad	6.89%
	Higher Education in reputed institute in India	10.34%
Working as medical professional	Obtaining a good placement in industry	100%
Both parents are working	Obtaining a good placement in industry	66.67%
	Higher education in reputed institute abroad	33.33%
Only one parent is working	Obtaining a good placement in industry	92.75%
	Higher education in reputed institute abroad	1.81%
	Higher education in reputed institute in India	3.63%
	Joining civil services	1.81%
Others	Obtaining a good placement in industry	80.96%
	Higher education in reputed institute abroad	4.76%
	Higher education in reputed institute in India	9.52%

Joining civil services 4.76%

The graphical representation of the student aspirations based on their family background is shown in figure 3.

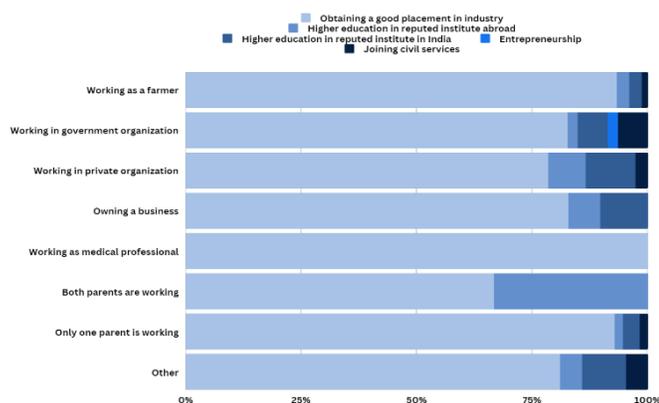


Fig. 3. Overview of student aspirations based on family background

VI. CONCLUSION

The aspirations of students are derived from a combination of factors. In the current study, 15 factors have been considered, out of which there are few dominant factors. Family income, peer motivation, chances of fulfillment of aspirations, government policies, current academic marks, opportunities provided by the institute and marks obtained in CET are the most influential factors that shape the aspirations of the engineering students. By considering the statistical significance, opportunities provided by the institute and government policies are the most significant factors among all.

The institute authorities should try to provide opportunities such as placement support, training and workshops, interviews and library facilities. The policymakers must also extend its support in the form of schemes and scholarships for higher study and creating employment opportunities.

It has been observed in the study that though students are from engineering background, they lack the entrepreneurial aspirations and prefer the job placements. Institutes should therefore inculcate the spirit of entrepreneurial aspirations among the engineering students.

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REFERENCES

Alam, A., & Zahoor, N. (2021). Educational and Career Aspirations of Undergraduate Students: An Exploratory Study. *Parishodh Journal*, 9(3), 5626-5639. DOI:10.13140/RG.2.2.29067.00804.

Drinkwater, J., Tully, M. P., & Dornan, T. (2008). The effect of gender on medical students-aspirations: a qualitative study. *Medical Education*, 42, 420-426. DOI:10.1111/j.1365-2923.2008.03031.x

Gale, T., Parker, S., Rodd, P., Stratton, G., Sealey, T., & Moore, T. (2013). Student Aspirations for Higher Education in Central Queensland: A survey of school students' navigational capacities. Report submitted to CQ University, Australia. Centre for Research in Education Futures and Innovation (CREFI), Deakin University, Melbourne, Australia. <http://hdl.handle.net/10536/DRO/DU:30064916>

Gutman, L., & Akerman, R. (2008). Determinants of aspirations [wider benefits of learning research report no. 27]. Centre for Research on the Wider Benefits of Learning, Institute of Education, University of London. ISBN: 978-0-9552810-7-5

Khattab, N. (2015). Students' aspirations, expectations and school achievement: what really matters?. *British Educational Research Journal*, 41(5), 731-748. DOI: 10.1002/berj.3171

Lele, V., Joshi, A., Shahabdkar, P., & Patil, V. (2021). Enhancing Employability Skills through Student Participation. *Education India Journal: A Quarterly Refereed Journal of Dialogues on Education*, 10(4), 296-305. ISSN: 2278-2435

Quaglia, R. J., & Cobb, C. D. (1996). Toward a Theory of Student Aspirations. *Journal of Research in Rural Education*, 12(3), 127-132.

Shahabdkar, P., Joshi, A., & Nandurkar, K. (2019). Developing IT Enabled Mechanism for SWOC Analysis: A Case Study. *International Conference on Manufacturing Excellence (ICMAX-2019)*, Feb.15-16 2019, 158-164. ISBN: 978-93-88441-69-8

Shahabdkar, P., Joshi, A., Lele, V., & Patil, V. (2021). Understanding Aspirations of First Year Undergraduate Engineering Students. *Journal of Engineering Education Transformations*, 34 (January 2021, Special Issue), 86-92. DOI:10.16920/jeet/2021/v34i0/157110

Tang, M., Pan, W., & Newmeyer, M. D. (2008). Factors Influencing High School Students' Career Aspirations. *Professional School Counseling*, 11:5, 285-295. DOI: 10.5330/PSC.n.2010-11.285