IMPACT OF PARENTAL SOCIO-ECONOMIC FACTORS ON STUDENTS' PERFORMANCE IN JEE-IIT EXAMINATIONS

Naresh Kumar

CSIR-National Institute of Science Technology & Development Studies, New Delhi, India

nareshqumar@yahoo.com

Impact of socio-economic factors (SEF) has always been a matter of debate on students' academic performance. Earlier studies established relationship between SEF and students' performance in examinations arguing that students from low socio-economic background lagged behind as compared to the students from economically high socio-economic families. However, there are also arguments who ruled out this notion. Therefore, this paper attempts to examine the impact of parental SEF on the student's performance in IIT-JEE Examinations, which is considered one of the tough and esteemed examinations for engineering admission in the India. Although, there are some limitations of the analysis due to paucity of time series data of the relevant attributes. The analysis shows that parents' income and level of parents' education unlikely influence the performance of students while parents' profession like engineering shows a positive influence on the students' performance in JEE-IIT examination.

INTRODUCTION

Joint Entrance Examination (JEE) is one of the prestigious examinations which is conducted every year for admission in undergraduate courses in engineering and technology in different National Institute of Technology (NITs) and Indian Institute of Technology (IITs). More than one million students appeared every year in the JEE examinations out of around 20,000 students qualified for the admission in IITs for different streams of engineering and technology courses. The volume of students appeared in the examinations shows a high degree of competition where success ratio is very low nearly 1:60 which leads to a tough competition. To get admission in IITs is a dream of most of the science students that prompts to do coaching in privately managed institutions. Consequently, the private coaching institutions are mushroomed in almost all the big and small cities such as Kota, a small city of Rajasthan which emerged a big coaching hub for engineering and medical aspirants. It was estimated that in Kota only there was an Rs 300 crore coaching industry during 2012-13, where 1.5 lakh students took coaching for cut-throat competition to crack IIT-JEE (Mishra, 2013). As a result, the coaching for admission in the IITs and other premier engineering colleges has acquired the status of a big coaching industry in India. According to the Associated Chambers of Commerce and Industry, the size of the coaching industry was about Rs 10,000 crore during 2008. ASSOCHAM's conclusion was based on the assumption that six lakh students attend engineering coaching classes every year and the average cost for each student was Rs 1.7 lakh (TOI, 2008). These estimates were only for preparation for admission in IITs and other engineering colleges. Apart from there are coaching institutions for the preparation of GATE, CAT and other competitive examinations such as Banking, Staff Selection Commission (SSC) and Civil Services examinations. Thus the magnitude of coaching industry is very big with a huge potential in future due to increasing volume of potential students for such competitive examinations. The demand for private coaching to get admission in IITs and other institutions raised a strong debate on the fairness of such

examinations as underprivileged students are unlikely getting an equal opportunity for admission in these premier institutions.

Sociological studies established a relationship between family's socio-economic status and the academic performance of children (Sparkes, 1999). The socio-economic factors like ethnicity, parental educational attainment, parental income type, housing type and student age as reflected by school level were found statistically significant variables and predictors of academic performance. However, it was also argued that family's socio-economic structure, the main source of family income and geographical location did not significantly predict variation in school performance of the students (Considine & Zappala, 2002). It was found that the academic achievement was influenced by the socio-economic status and those who aspirants belonged to high socio-economic status showed better performance (Ahmar & Anwar, 2013). Chandra and Azimuddin (2013) also argued that there was a positive correlation between SEF and academic achievements at secondary level students. Although, there are arguments both in favour and against the association of socio-economic factors with performance of the students. This leaves fair scope of further analysis of the hypothesis whether SEF and performance of students are associated statistically. So, this paper attempts to analyse the influence of socio-economic factors on the performance of aspirants in IIT- JEE examinations.

RELEVANCE OF THE PROBLEM

Several earlier studies established that the distribution of personal incomes in society is fairly related to education of the people (EFA Global Monitoring Report, 2005). Studies from the United States highlighted that there was a direct and fair correlation between test performance on earnings (Mulligan, 1999; Murnane et al., 2000). As there were arguments in the earlier studies in support of positive relationships between socio-economic factors and students' performance in the examinations. Therefore, this issue needs to be addressed, as large number of aspirants for IIT-JEE and other similar examinations are coming from small towns and rural areas who generally do not enjoy required economic assess. As a result, aspirants from economically underprivileged class are supposed to be at disadvantage in the cut throat competition for admission in country's such premium engineering institutions. The analysis could be useful for the policy makers as well as students writing for IIT-JEE examination and similar other competitive examinations. The analysis could be able to high light the issues of emerging trends of private coaching for competitive examination. This is relevant as the issue is frequently discussed that such practices are not in favour of fair chances of success to all the aspirants to get admission in various entrance examinations such as IITs which are comparable premier institutions globally.

EARLIER CONTEXTUAL STUDIES

A family's socioeconomic status is based on family income, parental education level and parental occupation which affect performance of students (Okioga, 2013). This implies that students from high socioeconomic status often have more chances of success because they have access to a wide range of resources that help them to promote and support in their education and development. The parents of such students able to provide their young children with high-quality care, books, and other various learning resources like private coaching in addition to regular school education. In a study of American students it was found that parents' involvement affect child's education, however, there could be a debate on definition of involvement (CPE, n.d). Apart from parents' years of schooling was also found to be an important socioeconomic factor to take into consideration in both policy and research when

looking at school-age children (Davis-Kean, 2005). Studies were also conducted to analyse linkages between academic performance of students' and their family's SEF and a positive correlation was found between the attributes.

Amutabi (2003) discussed the impact of socioeconomic status on children's readiness for school. Mayer (2002) argued that parental income is positively associated with a wide range of children's outcomes. Mayer's report advances beyond simple analyses of the connection between parental income and children's outcomes by focusing on research that attempts to separate the effect of income from the effect of other potentially confounding variables. The report provides estimates of the effect of parental income on a range of children's outcomes to try to determine the magnitude of such effects (Mayer, 2002). American Psychological Association (2001) discussed the relationship of family socioeconomic status to children's readiness for school. Charles Kombo Okioga (2013) claimed that across all socioeconomic groups; parents face major challenges when it comes to providing optimal care and education for their children. For families in poverty these challenges could be difficult. Ominde (1964) found that even in families with above average income parents often lack of time and energy to invest fully in their children's preparation for school, and they sometimes face a limited array of options for high-quality child care both before their children start school and during the early school years. This indicates that families with low socioeconomic status lack the financial, social, and educational supports to their children. Therefore, poor families may have inadequate or limited access to resources that may help to promote and support their children's development and school readiness. Moreover, parents may have inadequate skills for such educational activities and they may lack information about their children's future career and professional exposure. This adversely affects performance of the school/college going students. Therefore, inadequate resources and limited access to the resources likely have negative effect on young children's development, learning and their academic performance. Thus inferences can be drawn that children from families with low socioeconomic status are at greater risk of getting admission in IITs and other premier institutions through competitive examinations and deprived of better schooling and good education except few exceptions.

RESEARCH METHODOLOGY

To analyse influence of parents' SEF like education, profession and income on students' performance in IIT-JEE examinations simple statistics of mean deviation (MD) and standard deviation (SD) techniques were applied. Both techniques are widely accepted for examining variability between dependent and independent variables. Variability between variables conveys certain kind of information that illustrates strengths and weaknesses of linkages between dependent and independent variables. Statistical measures of variation are used frequently for quantitative and qualitative variables. Accordingly, statistical variance approach is used to examine effect of prominent SEF namely parents' education, occupation and income on their children's performance in IIT-JEE examination. Data for the purpose was collected from various Reports of the Joint Implementation Committee by IITs. The Mean Deviation and Standard Deviation (σ) were calculated by using the following formulae respectively:

$$\bar{x} = \frac{x_1 + x_2 + \cdots + x_n}{n}$$

where $x_1, x_2, \ldots, x_n$ are variable and $\bar{x}$ represent mean of variables.

The Standard Deviation (σ) was calculated using the following formula:

$$\sigma = \sqrt{\frac{1}{N}\sum_{i=1}^{N}(x_i - \mu)^2}$$

S.D. is a measure that is used to quantify the amount of variation or dispersion of a set of data values.

DATA ANALYSIS AND DISCUSSION

Descriptive statistics tools namely Mean deviation and Standard Deviation were used to analyze the collected secondary data regarding parental income, occupation and education of the successful students in IIT-JEE entrance examination. The data was collected from various years JEE (Advanced) Reports (JEE, 2013; 2014). Every year more than one million IITs aspirants appeared in the examination. The aspirants comprise students from all socioeconomic strata which make data unbiased and random. The collected data was analyzed with the help of SYSTAT (1988) statistical package and respective result are given in Tables-1, 2, 3.

Range of Parents' Income	Mean Deviation	Standard Deviation
< 1 lakh	12.900	8.397
1-3 lakh	7.827	4.926
3-6 lakh	27.065	18.490
6-10 lakh	19.207	11.839
> 10 lakh	19.360	14.170

Table 1: Mean deviation and standard deviation for different range of parents' income

Level of Parents' qualification	Mean Deviation	Standard Deviation
Both Graduate	32.050	24.326
One Graduate	15.705	18.816
Neither	9.880	11.795

Table 2: Mean deviation and standard deviation of parents' qualification

Parents' Profession	Mean Deviation	Standard Deviation
Agriculture	4.958	3.867
Business	10.625	7.778
Medicine	4.125	1.824
Engineering	3.860	0.987
Law	1.640	1.121

Teaching	3.853	1.703
Government	16.035	15.563
Private	6.008	5.105
Defence	1.490	1.103

Table 3: Mean deviation and standard deviation of parents' professions

Analytical results indicate that parents' socioeconomic factors affect the student performance in the IIT JEE entrance examination. As argued in the earlier studies that parental income, occupation and level of education are directly associated with academic performance of their children, the analysis provides the dissimilar results. Based on the summary findings, it was observed that the performance of those students was comparatively consistent whose parents' income was in the range of 1-3 lakh. Similarly, those students whose both parents were not graduate their performance was consistent in the examination than other students. Contrary, analysis indicates that performance of those students were consistent whose parents' occupation was engineering. This could be obvious as parents with engineering background and occupation encouraged their children to opt engineering as a career since their early schooling. Here, it may be argued that profession of engineering is considered as a noble profession in Indian society as compared to other professions. However, the argument that parents' socioeconomic factors like education level, income and profession affect performance of the students in JEE-IIT examination cannot be declined because maximum number of entrants in IITs are those who took regular coaching from private institution which are very costly. This analysis simple reflects that the performance of under privileged students is fairly consistent. It implies that if students from underprivileged section of society could get good opportunities and resources for their education they could perform better in entrance examination of like JEE-IIT. In this context an example of Anand's Super-30 is much relevant to cite as every year nearly 30 underprivileged students compete the JEE-IIT examinations.

CONCLUSIONS

It may be conclude that the SEF are not vital factors that influence performance of the students in IIT-JEE examinations. Performance of those students was consistent who were coming from low income strata and whose both parents were not highly educated. If they get good opportunities in respect of good schooling and financial resources they could likely perform better in such examinations which are evident from the analysis. However, students whose parents' profession was engineering they could perform better than other students. On the other hand it was observed that students from some selected education boards shown better performance in JEE-IIT examination over the years. This was substantiated by the Times of India report that in 2013, almost 80% students qualified for IIT-Advanced examination came from three school boards only namely Central Board of Education (CBSE), Andhra Pradesh state board and Punjab state board. While, in 2010, 58% qualified from CBSE board, 36% from state boards and 6% from Indian Certificate of Secondary Education (ICSE) board. However, in 2014, CBSE sent 42% students in IITs. Thus the statistics indicates that the IIT-JEE examination is unlikely gives fair chance to all the aspirants from all the state boards as the pattern of examination seems to be skewed towards very few boards. This can be argued that there was a quality divide between the CBSE board and other states boards that needs to be bridged. Hence, there is a need to break the dominance of

private coaching institutions and domination of few education boards by integrating uniform syllabus across all the state boards and improving the quality of education.

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