

EXECUTIVE SUMMARY

In these days of economic liberalization and globalization it has become important for any nation to be Industrially competitive. The industrial competitiveness of a nation depends greatly upon how effectively the engineering manpower is utilized within the industrial infrastructure. In this context, studies regarding various factors influencing selection of careers and proper utilization of engineering manpower provide important inputs for national level planning and policy formulation.

Selection of careers is often influenced by socioeconomic factors. However, the human dimensions involved in the process, like the perception of people regarding their careers and the needs associated with it, are also very important as they provide vital clues on the career selection and career change patterns of the individual. Studies have been carried out in different IITs on Brain Drain or migration of engineering personnel to developed countries, but no comprehensive studies on career patterns of engineering graduates, along with its antecedents and concomitants, seems to have been carried out so far in India. The present study deals with the career patterns and the processes governing career selection, career migration and career aspirations of engineering graduates, in the context of different socio-economic and personal background variables.

The sample for this study is drawn from the alumni of IIT Kharagpur who graduated between 1982 and 1991. The addresses of the alumni were collected through a multistage address collection procedure which yielded a database of 1201 confirmed addresses. A questionnaire was finalized following four pilot studies. Two of these studies aimed at gathering opinions from a wide cross section of people, including experts from various fields on the aspect of career migration. Two other studies were carried out on engineering students at IIT

Kharagpur, with a view to get an idea of their career preferences and the background factors that seem to influence such preferences. The questionnaires administered under controlled conditions in the latter two studies were also meant to give an insight into ambiguities, if any, faced by respondents to the questionnaire. The questionnaire was mailed to all confirmed addresses. A total of 649 responses were received following three rounds of reminders, of which 502 are from alumni in India and the remaining 147 from alumni abroad.

In respect of alumni in India, the results suggest that a larger fraction of IIT Kharagpur alumni are employed in government and public sector organizations compared to the alumni of other IITs. Their career profiles suggest that most of the alumni are in engineering oriented careers. This is also corroborated by their knowledge utilization pattern. Almost half of the alumni have not changed any job. The various course components and other aspects of training and education at IIT have been found equally useful by the alumni for their careers. Almost half of the alumni seem to have gone for higher education and about half of all those who have taken up higher studies have gone in for management degrees. Although more individuals are presently in engineering careers, at least a third of them would like to switch over to non-engineering careers like Management, Sales and Civil Services. Regarding their opinion on migration, 38.6 % of the alumni thought that migration to non-engineering careers is a waste of national investment, while 33.7 % thought otherwise. Given a choice, the alumni would have chosen Computer Science, Electronics or Mechanical Engineering as their field of specialization. More than 50 % of the alumni say that Engineering would have been their preferred area of study even if they had a free choice, without pressure from any source at the end of 10+2. About 24 % of others would have preferred Science to any other subject. An investigation into the entrepreneurship behaviour of the alumni revealed that lack of resources/proper family background are the primary reasons cited for not being an entrepreneur. The socio-economic background factors have also been analyzed and indicated a definite change in the demography of IIT Kharagpur alumni over years.

Interrelationships between selected variables were also examined. It is observed that individuals securing lower grades, or not getting their preferred area/specialization for study due to external reasons, have a greater tendency to migrate to non-engineering careers. Individuals from cities with higher family income are more oriented towards non-engineering careers and possessed higher drive for entrepreneurship. A higher percentage of alumni with internal locus of control, high self esteem and high job satisfaction have taken to non-engineering careers.

In respect to alumni abroad, most of them are working in non-manufacturing type of organizations dealing with software, services and consultancy. There is a distinct difference in the career pattern of alumni abroad when compared to alumni in India. A higher percentage of them have gone for MS/Ph.D. and much less for MBA. The major job functions of alumni abroad are R&D, Design, Consultancy, Software and Teaching, in that order. More time is spend by alumni abroad in R&D and technical activities per weak.

The findings of this study has lead to certain recommendations for consideration at various levels. Introduction of career counselling at school and an aptitude test for admission to engineering institutions have been recommended, to attract students really interested in engineering to the engineering institutions. Putting in place effective units at engineering institutions for career counselling, for arranging industrial exposure to the students and for ensuring their proper placements have been suggested, to ensure better utilization of engineers. It has been recommended that traditional employers of engineers take appropriate steps for providing a greater challenge to the engineers in their career and a compensation package comparable to what management graduates get. Industries must interact with Institutions and fund industrial projects to be taken up by undergraduate students. It has also been recommended that Institutes should encourage participation of experts from industry in curriculum development and teaching, provide real life projects for undergraduate students and greater opportunities for their exposure to industrial environment. These steps, it is believed, will go a long way to ensure proper utilization of engineers for national development.