Technical education in India in the recent years has witnessed radical changes with high achievements in the field of science and technology coupled with the saddening phase of development displayed in the form of a large army of underutilized and unemployed technical manpower. Technical manpower in India is unemployed owing to the imbalances created in the labour market with an expanding supply-demand gap. The educational policies framed during the post liberalisation period in the technical and professional education resulted in vertical and horizontal expansion of technical institutions. At the same time less than the proportionate growth in the manufacturing and other technical absorbing sectors further worsened the existing supply-demand gap. An analysis of the features observed in the
technical manpower in India represents multi dimensional facets due to its diversified characteristics across various types and regions. The present analysis is an attempt to understand the employment aspects and the incidence of unemployment observed in the engineering labour market at the diploma and graduate level in the state of Kerala.

7.1 Activity Status of the Diploma and Graduate Engineers in Kerala

The activity based analysis of the engineers in Kerala shows that the majority of the engineers both at the diploma and graduate levels are largely employed as regular paid employees with observable difference at the graduate level. Thus it reveals the preference of engineers for employment soon after the completion of their course. The difference in the activity of the engineers shows that there is an observable difference in the activity status both among the diploma and graduate engineers across the characteristics of their branch of study, gender, social category and type of institution of study implying that such factors have a significant influence on determining the activity status of engineers in Kerala after passing from their respective courses. The spread of activity of engineers, even if it is highly divergent between the diploma and graduate engineers, the strength of the each factor determining the nature of the activity among the engineers is not equal among both the diploma and graduate engineers.

The main activities of the engineers include regular paid job, self employment, on contract job and on apprenticeship training. The engineers also pursue higher studies and the rest are unemployed. A majority of the engineers are in regular paid job among both the diploma and graduate engineers. The other employment opportunities for engineers include self
Concluding Observations

employment, contract job and apprenticeship and the magnitude representing its strength is irrelevant because of their minuscule value. The branch-wise difference in the activities of the engineers both among the diploma and graduate engineers shows that the branch of study is a factor influencing employment with some branches exhibiting higher rate of employment absorption and others indicating higher incidence of unemployment.

Similarly it is observed that the male engineers are more in employment than the female engineers among both the diploma and graduate engineers. On the other hand, the incidence of unemployment among the female engineers is high both at the diploma and graduate levels. On examining the rate of employment an upper hand in getting employment sooner is observable among the OBCs at the diploma level, whereas among the graduate engineers the engineers belonging to the general category are more privileged to get early employment. The rate of unemployment is high among the OBCs both at the diploma and graduate levels of engineering. The activity status of the engineers as observed shows that it is also influenced by the type of institution of study and the employment absorption is high among the engineers from the government colleges at the diploma level. But at the graduate level it is observed that the engineers from private aided colleges are privileged to get employment sooner. As these institutions are small in number and have a good track record of the infrastructure and number of faculty many of the meritorious students are attracted to this thereby positively influencing the rate of employment absorption.

Among the various avenues of employment, it is observed that the engineers prefer to be in the status of a regular paid employee. Even if self employment is considered as a good opening for engineers by many of the
experts, it is found that the engineers are reluctant to take any risk. Thus engineers here practice risk aversion by taking refuge in employment under an employer rather than displaying their own entrepreneurial skills.

The diploma engineers outnumber the graduate engineers in pursuing higher studies. But while comparing the diploma and graduate engineers who are pursuing higher studies a uniform pattern in their distribution across the various characteristics of the population is not evident.

As the unemployment among the engineers assumes dimension of higher proportion and also understanding that the engineers are less in number taking self employment, it is suggested that efforts should be taken to enhance the scope of self employment. This opinion holds significance under the condition of accepting the fact that the engineers are easily trainable since they are already skill equipped.

7.2 Employment Profile of the Diploma and Graduate Engineers in Kerala

The engineers after the completion of their course at the diploma and degree levels reveal their preference for employment as a majority of the engineers are on regular paid job and other types of employment. The employment conditions of these engineers who are employed reveal some unique characteristics indicating their profile of employment.

The employment profile of the engineers examined on the basis of their area of employment shows that diversion to other areas of specialization is more prevalent among the graduate engineers than the diploma holders. This is possibly because the graduate engineers have larger employment opportunities than the diploma engineers in other areas owing to the nature of the
qualification acquired while they are also eligible for employment requiring a minimum graduate degree. The gender analysis of the employment area of the engineers shows that diversion among the female engineers is more prevalent compared to the male engineers. It is also observed that a majority of the engineers have diverted to other areas for employment because of no job opportunities in their area of specialization.

Function wise analysis of the engineers based on the type of function performed in their capacity shows that a majority of the engineers are in engineering related services, but the magnitude of it is high among the diploma engineers as compared to the graduates. Next to engineering related services, teaching is the important function for the diploma engineers, whereas among the graduate engineers software is a good opening for large employment opportunities. The dependence for employment on other non core areas among the majority of the engineers has questioned the need of opening new engineering colleges. The expert opinion in this regard is that starting new engineering colleges will further aggravate the problem of adverse employment conditions existing in the engineering labour market. The employment function of the engineers again shows that more of the male engineers are in engineering related areas, whereas the females are in other non engineering areas of employment. The analysis of the employment function based on their social category shows that engineers who have completed diploma and hailing from the general category are more in engineering related services whereas among the graduate engineers, the engineers belonging to the SC and ST are more privileged to get absorbed in engineering related services. The level of parental education however does not affect much in determining the employment function among both the diploma
and graduate engineers. The difference in the employment function between the rural and urban diploma engineers is also marginal and insignificant in Kerala. Among the graduate engineers such a difference is found to be significant and more of the rural graduate engineers are employed in engineering related services. But in the software sector, the urban graduates are privileged to get more employment. The institutional difference in the employment function is also found significant only among the graduate engineers. The engineers coming out from the private aided colleges are relatively more in the engineering related services vis-a-vis to the engineers from the government college both at the diploma and graduate level.

The employment of the engineers in various sectors shows that both the diploma and graduate engineers are largely employed in the private sector leaving only little scope for the government and the public sector in the role of a prospective employer. The branch-wise difference in the rate of employment among the diploma and graduate engineers shows that the engineers in some branches are privileged to get more employment in the private sector and such a difference is significant. The gender distribution of engineers in employment across the various sectors of employment shows that the male engineers are more employed in the private sector. At the same time the employers obviously have a preference for engineers from the forward communities and the fact is borne out by the abundant presence of such engineers in their service. Thus it means that as the role of the private sector increases the immediate effect on the labour market is that it undermines the scope of employment of the underprivileged and those of the backward community. It is because in the private sector there is no mandatory requirement of appointments based on the principles of reservation for the backward classes.
Further the categorization of the engineers based on the type of institution of study shows that the private sector employment is more among the engineers passing from the private unaided colleges. But the difference in employment between the sectors based on the type of institution of study is found significant only among the graduate engineers.

Among the different means through which the engineers are employed, direct application is the largest source of getting employment. The role of placement cells functioning in institutions which assist in arranging employment for the engineers is found to be important only among the graduate engineers as only a few number of diploma engineers are absorbed in employment through the campus or off campus placements. The difference existing between the various means of getting employment across the branch of study is found to be significant both among the diploma and graduate engineers. But their difference based on the social category of the engineers is significant only at the graduate level. For all other characteristics of the engineers such as gender, type of institution and the region of institution, the difference between the various means of getting employment is found to be insignificant.

The level of job satisfaction among the engineers shows that the highest level of job satisfaction is attained among the graduate engineers compared to the diploma engineers. The dissatisfaction from job is high among the diploma engineers compared to the graduates. The male engineers are more satisfied with job as compared to the female engineers. The level of job satisfaction however is not influenced by the degree of the social backwardness of engineers as the level of job satisfaction does not reveal any uniform pattern of distribution based on the social category of engineers. Similarly the job satisfaction attained
among the engineers classified on the basis of the type of institution of study shows that the satisfaction with job is found to be high among the private institutions, including both the aided and unaided institutions compared to the government colleges. The difference in the level of satisfaction is found to be significant only in the branch of study and gender among the diploma engineers. But among the graduate engineers such difference is found to be significant only in the social category and type of institution.

The monthly income of the engineers shows that the graduate engineers are earning more than the diploma engineers. Therefore the level of satisfaction is also high among the graduate engineers. The average monthly salary of the male engineers is higher than that of the female engineers. Similarly the average monthly salary of diploma engineers belonging to OBC is higher than the other categories and among the graduate engineers the average monthly salary is high among the general category. The average monthly salary of the engineers from the private aided colleges is higher than that of the engineers from other types of institutions among both the diploma and graduate engineers. The rural diploma engineers earn more than their urban counterparts whereas the urban graduate engineers are earning more than the rural graduates. Among the diploma engineers those who are in engineering services and IT related fields earn maximum income, whereas among the graduate engineers the highest income is drawn by those who are in administration and management. The monthly income drawn when compared between the various sectors shows that the engineers from the private sector earn the highest in both the diploma and graduate categories. The difference in the level of income is found to be significant both among the diploma and graduates when classified only on the basis of their branch of study and their
gender. But such difference is found to be significant only among the graduates when classified on the basis of their social category, type of institution and area of residence though they are insignificant among the diploma engineers. The level of satisfaction attained from income among the engineers shows that their difference between the branches of study is insignificant. The level of monetary satisfaction among the male engineers is higher than that of the female engineers and this difference in the level of satisfaction is significant both among the diploma and graduate engineers. Similarly the level of monetary satisfaction is high among the engineers belonging to the general category and the difference in the level of satisfaction is significant only among the diploma engineers. The level of satisfaction attained by the engineers classified on the basis of their type of institution of study does not reveal any uniform pattern to make any precise generalization but the engineers from private institutions are more satisfied compared to the government institutions. The level of monetary satisfaction again shows that the urban engineers are more satisfied among both the diploma and graduate engineers but the difference in the level of satisfaction obtained from income is significant only at the graduate level.

As the employment profile of the engineers shows higher diversification of employment to other non engineering areas and also considering the fact that the functions rendered by many of them are revealing less satisfaction, it is suggested that concerted efforts should be taken by the government and institutions to place the engineers in their core branch of study. This will help them to increase their level of job satisfaction and also their level of income. The discrimination of any form can be arrested only when the government takes effective steps to control the labour market. Initiatives should be taken to
intervene in the labour market so that it is not left over to the mercy of the private players where a monopoly is established by them in the labour market. The direct application is the major source of employment which leaves the employee to a disadvantage because it develops a psychological barrier among the job seekers. This can be reduced only by increasing the scope of other sources of employment such as placement cells, institutional arrangement of jobs, etc.

7.3 Academic Achievement of the Diploma and Graduate Engineers, the Engineers Pursuing Higher Studies and the Reasons for Pursuing Higher Studies

A comparison of the academic achievement of the diploma and graduate engineers does not show any large difference in the samples, but the mean achievement of the diploma holders is higher than that of the graduate engineers. Academically the female engineers excel slightly better than the male engineers and this difference is significant only among the graduate engineers. The academic achievement of the engineers based on their social category also reveals that the engineers belonging to general category outperform the other engineers who hail from the backward communities. The difference in the academic achievement based on the social category is found statistically significant both among the diploma and graduate engineers. Similarly the urban engineers are academically better than the rural engineers. The difference in the academic achievement between the rural and urban engineers is found to be significant only among the graduate engineers. It is also observed that the engineers from government colleges are better than the engineers from other types of institutions in terms of their academic achievement even if such a difference is only significant among the graduate engineers. The academic achievement of the engineers compared on the basis
of their parental education also shows that the engineers of the highly educated parents record higher academic achievement than the rest of the group implying the influence of the parental education on the academic performance of the engineers.

The engineers now opting for higher studies are so many and higher studies are considered to be one of the important engagements of the engineers after the completion of their respective courses. The number of diploma engineers opting for higher studies is relatively more in their respective areas than the graduate engineers. The engineers opting for higher studies based on their gender characteristics show that both male and female engineers choose other non engineering areas for higher studies among the diploma engineers, whereas among the graduates the females prefer engineering areas for higher studies. The area of study of engineers when examined on the basis of their social category also shows that the engineers belonging to the general category have chosen other non engineering areas for higher studies. Similarly it is also observed that the urban engineers have a preference for non engineering streams vis-a-vis the rural engineers. However no definite conclusions can be drawn with regard to the engineers opting for higher studies based on their level of parental education.

The major factors influencing engineers to join for higher study are self-interest and it is evident both among the diploma and graduate engineers. The next important factor influencing higher studies among the diploma engineers is career improvement. Among the graduate engineers a large number of them join for higher studies because of no job offer and hence their preference for higher studies is a subtle aversion from the status of unemployment. The
difference in the reasons for joining higher studies is found to be significant only in the branch of study among both the diploma and graduate engineers.

Academic improvement of the engineers is now a necessity as many of the engineers seek employment also through competitive examinations and GATE score. The category-wise differences in the academic achievement based on various factors show their disparity which can be reduced to a large extent by providing training to the weaker engineers and thereby reducing their failure rate. This will improve the quality of engineering education in total. The engineers pursuing higher studies is to be encouraged to reduce immediate unemployment arising due to large outturns and this can be practiced by broadening the dimension of the qualifications required for employment in areas which essentially requires higher levels of learning.

7.4 Unemployment and Underemployment among the Diploma and Graduate Engineers and the Cause of Unemployment

The kind of unemployment prevalent among the engineers is the Keynesian involuntary type of unemployment. The engineers are in search of a job in engineering and their concepts about the type of job to be chosen and the reservation wages set by them for accepting employment prevent them from taking any job that is below their expectation. Thus the engineers who are presently unemployed cannot be considered as unemployed forever. The present unemployment is a kind of the job search period of unemployment exposing the widening of the length of the waiting period for employment of engineers. It is an unwarranted phenomenon.

The rate of unemployment is found to be declining among the diploma engineers, but the unemployment rate among the graduate engineers is
incremental based on the secondary data. The primary data shows that the rate of unemployment is still high among the diploma engineers compared to the graduate engineers. Thus the incidence of bumping down theory is truly absent in the engineering labour market since the analysis of their rate of unemployment over a period does not reveal any preference for graduate engineers by the employers substituting the diploma engineers.

A comparison of the rate of unemployment among the diploma and graduate engineers based on some characteristics shows that the branch of study is a decisive factor of employment among the engineers. The rate of unemployment among the female engineers is found to be higher than that of the male engineers. Based on the social category of the engineers, it is found that among the diploma engineers those belonging to the general category are more unemployed compared to other social categories. But among the graduate engineers the incidence of unemployment is more among the socially backward communities. Among the diploma engineers the rate of unemployment is high among the urban engineers compared to the rural. But at the same time the incidence of unemployment is higher among the rural engineers than among the urban at the graduate level.

The underemployment of the engineers is another important observable phenomenon in the engineering labour market. The narration of the engineers being underemployed means that the engineers are discriminated against each other as some of the engineers draw monthly income less than the average monthly income of the rest of the engineers in their particular branch and course of study. The incidence of underemployment is higher among the graduate engineers as compared to the diploma engineers. Similarly the male engineers are underemployed more than the female engineers at graduate level.
only. The rate of underemployment is found to be not related to the degree of backwardness among the engineers since it is found to be high in the SC and ST category among the diploma engineers but among the graduate engineers underemployment is high among those belonging to the other backward classes. The rate of underemployment is also found to be high among the rural engineers than the urban engineers. The institutional classification of engineering colleges also reveals an unhealthy trend in the distribution of underemployment among the engineers as it is found that underemployment among the diploma engineers is high in government colleges. But among the graduate engineers the rate of underemployment is found to be high among engineers from private aided colleges.

The factors that positively affect the prospect of employment among the engineers is the branch of study in engineering and monthly income of the family which is commonly observed both among the diploma and graduate engineers. Other than this among the diploma engineers, their social category is also found positively influencing employment, whereas among the graduate engineers the area of residence of the engineers and the type of schooling undergone and the academic performance of the students are also found to be positively influencing their prospects of employment based on the logistic regression.

There are a large number of factors that cause unemployment among the engineers. The prominent among them is the lack of job opportunities in their respective area of study. The incidence of unemployment among the female engineers is also because of the family responsibilities undertaken after marriage but its incidence is high among the graduate engineers. The job search period of unemployment is high among the graduate engineers since
more of the graduate engineers are looking for better opportunities compared to the diploma engineers. The difference in the academic performance of the students has not resulted in unemployment among the engineers. The unemployment among the engineers in totality shows that the difference in the course of study, the gender features, the type of institution of study and the level of parental education with their unique features largely explains the cause of unemployment among the engineers.

The cause of unemployment as revealed shows that there are certain factors that are much controllable such as the lack of employability among the engineers. Hence efforts should be taken to restructure the syllabus in engineering in the direction of improving the employability skill of the engineers through interaction with the industry to get a correct feedback on the industry requirement. The curriculum should also be structured in such a way that the exposure to industry experience will directly benefit the engineers in increasing their employability. Efforts taken in this direction in Kerala at the diploma level is really commendable and the Technical University has also started the initiative of restructuring the curriculum.


