



Factors of employability skills of engineering graduates: An analytical study using Friedman Test Multiple Regression

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Abstract

Employability skills and placement rate becomes the buzz words to bench mark for the quality of engineering education among the technical institutes in the country. The gap between pass out ratio and placement ratio among the engineering graduates is alarming and indicating the poor levels of skill set of the engineers. The reasons for the same are many and multifold. The present paper is focused on studying the role of personal factors, life skills factors, teaching and learning factors, and evaluation systems and improvement practices environment in the employability of the engineering graduates from Hyderabad city. For the purpose of the study, selected students from the engineering colleges in the city are drawn as sample using judgment sample method. The study is descriptive and exploratory in nature. The sample size for the study is fixed at 600 and the final analysis is done with 512 samples. The data required for the study is collected through a pretested structured questionnaire. All the students are from eighth semester and appearing for placements. Some of the students are already placed and waiting to complete the course. The combination of the experiences in the interviews and the skill gaps observed in the self assessment is presented.

The study results reveal that, life skill factors, teaching learning and evaluation systems are highly important in employability skills of the engineering graduates. The relationship between the employability and the selected variables are highly significant at 1% level of significance. A structured practical sessions and application oriented training along with practical sessions and strict evaluation systems along with options for improvement can help the students to realize and learn the required skills and there by improved level of employability among the engineering graduates in the sample. Further, it indicates the need for revamping the old pedagogy and adoption of new ICT and CTT in teaching learning processes can help in resolving the issue at the earliest possible time. The role of a teacher can never give up in training and molding the young graduates of any selected field of study. The teacher issues in this sector needs a special care and concern to get the improved level of professional deliverables and service quality among the technical institutions in the field.

Keywords: Pedagogy – Teaching Learning Process – ICT-CTT-Practical Sessions – Application Oriented.

1. Introduction

Personal factors play a dominant role in an individual's attitude towards learning and development. In some cases, the learning environment and systems helps to improve the employability skills and there by better learning and career prospects to a learner. With this assumption, the current study is carried out to assess the role of personal factors, life skill factors, TLP factors and Evaluation factors role in the employability of the engineering graduates in the Hyderabad city. The teaching learning practices in engineering education should focus on practical and application oriented. Since the liberalization, and privatization private sector entry into engineering education was happen in a massive manner. Dilution of standards at all levels is initiated and it has impacted the employability of the graduates within a short span of time and becomes an issue. In this parlance, the present paper is focused on assessing the role of personal factors, life skill factors, teaching learning factors and evaluation and improvement factors in employability of the engineering graduates among the engineering colleges from Hyderabad is studied.

2. Research Methodology

The present paper is focused on studying the role of personal and academic factors in the employability of the engineering graduates from Hyderabad city. For the purpose of the study, selected students from the engineering colleges in the city are drawn as sample using judgment sample method. The study is descriptive and exploratory in nature. The students participated in the survey are final years and appearing for the campus placements and few of them are placed. The sample size for the study is fixed at 600 and the final analysis is done with 512 samples. The data required for the study is collected through a pretested structured questionnaire. All the students are from eighth semester and appearing for placements. Some of the students are already placed and waiting to complete the course. The combination of the experiences in the interviews and the skill gaps observed in the self assessment is presented.

3. Objectives of the study

1. To study the role of personal and life skill factors effects on employability of students among the engineering colleges in Hyderabad city.
2. To study the teaching learning factors and evaluation, improvement factors influencing the employability skills of the engineering graduates in the sample area.

Hypothesis

1. H₁: There is no significant difference between mean ranks of personal factors affecting the employability skills among the engineering graduates in the sample.
2. H₂: There is no significant difference between mean ranks of life skill factors affecting the employability skills among the engineering graduates in the sample.
3. H₃: There is no significant difference between mean ranks of teaching learning factors affecting the employability skills among the engineering graduates in the sample.
4. H₄: There is no significant difference between mean ranks of evaluation and improvement factors affecting the employability skills among the engineering graduates in the sample.

4. Data Analysis and Results Discussion:

Null Hypothesis H1: There is no significant difference between mean ranks of personal factors affecting the employability skills among the engineering graduates in the sample.

Table 1: Friedman test for significant difference between mean ranks of personal factors affecting the employability skills among the engineering graduates in the sample

Personal Factors affecting Employability Skills	Mean Rank	Chi-square value	P Value
Age	9.82	144.434	0.001**
Gender	10.82		
Previous Medium of Study	11.29		
Previous School study	9.66		
Previous place of study	11.78		
Parental educational back ground	10.96		
Language spoken at home	9.52		
Occupation of the parents	11.99		
Peer groups	11.63		
Mentor teacher who taught	11.53		

Since p value is less than 0.01, the null hypothesis, There is no significant difference between mean ranks of personal factors affecting the employability skills among the engineering graduates in the sample is rejected at 1% level of significance. Hence, it is concluded that, there is a highly significant difference between mean ranks of personal factors affecting the employability skills among the engineering graduates in the sample. Based on the mean value, it is noticed that, medium of study, place of study, parental occupation, peer groups and mentor teacher plays a major role in improving the employability skills of the engineering graduates among the technical institutes in Hyderabad city.

Null Hypothesis H2: There is no significant difference between mean ranks of life skill factors affecting the employability skills among the engineering graduates in the sample.

Table 2: Friedman test for significant difference between mean ranks of Soft skills/personality/interpersonal factors affecting the employability skills among the engineering graduates in the sample.

Soft skills/personality/ interpersonal skills	Mean Rank	Chi-square value	P Value
Self insight and flexibility	10.65	152.65	0.001**
Attitude towards change and learning new things	11.18		
Self motivation	11.69		
Goal setting and planning	10.87		
Professional Etiquette- e-mail-telephone-time management	11.39		
Communication-listening-speaking-reading-	11.43		
Group discussion skills	10.92		
Team building and sharing attitude	11.13		
Problem solving skills	10.76		
Digital skills- usage of modern apps, social media, literacy level	10.46		
Presentation skills of data	11.53		

Since p value is less than 0.01, the null hypothesis, There is no significant difference between mean ranks of life skill factors affecting the employability skills among the engineering graduates in the sample is rejected at 1% level of significance. This proves that, statistically, there is a highly significant difference between mean ranks of life skill factors affecting the employability skills among the engineering graduates in the sample. Based on the mean scores, it is noted that, attitude, self motivation, self etiquette, communication, team spirit and presentation skills play a major role in employability of the young graduates in technical institutions. Hence, it is necessary to a technical graduates to focus on life skills for better prospects in the career.

Null Hypothesis H3: There is no significant difference between mean ranks of teaching learning factors affecting the employability skills among the engineering graduates in the sample.

Table 3: Friedman test for significant difference between mean ranks of teaching learning factors affecting the employability skills among the engineering graduates in the sample.

Teaching Learning Variables / factors	Mean Rank	Chi Square Value	P Value
Number of class hours conducted	11.49	233.085	0.000**
Number of practical sessions	12.41		
Freedom to present views and discuss in the class	10.75		
Equal learning opportunities to all in the class	9.63		
Individual focus and control	11.44		
Combination of Teaching methods adopted as per the subject	11.06		
Sufficient time span to understand and present the same	9.78		
Usage of ICT in teaching and learning	10.18		
Percentage of practical learning in total	10.08		
Proto models creation through projects and presentations	10.60		
Internships and workshops composition per semester	10.40		
Visiting industries and attending training programs	10.06		
Opportunities to express and present the ideas in forums	11.47		
Subject interest groups forming for assignments	11.19		
Youth talent search guiding and conducting contests	11.03		

Since p value is less than 0.001, the null hypothesis, There is no significant difference between mean ranks of teaching learning factors affecting the employability skills among the engineering graduates in the sample is rejected at 1% level of significance. Hence, it is concluded that, there is a highly significant difference between mean ranks of teaching learning factors affecting the employability skills among the engineering graduates in the sample. Based on the mean ranks, it is noted that, number of class hours, practical sessions, individual focus, and combination of teaching methods, opportunity to express the ideas, subject interest groups, and talent hunt contests plays a vital role in improving the employability skills among the engineering graduates in the sample. Hence, effective teaching and learning opportunities to the graduates in engineering education helps to promote the employability skills of the engineering graduates.

Null Hypothesis H4: There is no significant difference between mean ranks of Evaluation and improvement factors affecting the employability skills among the engineering graduates in the sample.

Table 4: Friedman test for significant difference between mean ranks of organizational factors affecting the employability skills among the engineering graduates in the sample.

Evaluation and improvement Factors	Mean Rank	Chi Square Value	P Value
Frequent assessment tests	10.61	88.833	0.000**
Continuous learning and assessment	12.00		
True and fair evaluation practices	11.36		
Academic performance encouragement and suggestions	8.04		
Open day practices/failure analysis system	7.59		
Success practices sharing and discussion	7.36		
Core focus on comprehensive career growth	6.93		
Counseling and guidance practices	10.99		
Practical exams and weightage in marks	10.51		
Additional credit courses based on student interest	7.72		
Value added courses conducting and participation level	8.87		
Presentations and models exhibition	9.13		
Evaluation of personality and soft skills	9.19		

Since p value is less than 0.001, the null hypothesis, There is no significant difference between mean ranks of Evaluation and improvement factors affecting the employability skills among the engineering graduates in the sample is rejected at 1% level of significance. Hence, it is concluded that, there is a highly significant difference between mean ranks of Evaluation and improvement factors affecting the employability skills among the engineering graduates in the sample. Based on the mean scores, it is noticed that, frequent assessment, continuous learning, true and fair evaluation, counseling and guidance, practical sessions are the key elements in evaluation helps in improving the employability skills of the engineering graduates in the sample. Hence, steps in this direction can help in improving the situation in the years to come.

Data Analysis using Regression:

Regression is the determination of statistical relationship between two or more variables. In simple regression two variables are used. One variable (independent) is the cause of the behaviour of another one (dependent). When there are more than two independent variables the analysis concerning relationship is known as multiple correlations and the equation describing such relationship is called as the multiple regression equation. Regression analysis is con-

cerned with the derivation of an appropriate mathematical expression is derived for finding values of a dependent variable on the basis of independent variable. It is thus designed to examine the relationship of a variable Y to a set of other variables $X_1, X_2, X_3, \dots, X_n$. the most commonly used linear equation in $Y = b_1 X_1 + b_2 X_2 + \dots + b_n X_n + b_0$

Here Y is the dependent variable, which is to be found. X_1, X_2, \dots and X_n are the known variables with which predictions are to be made and b_1, b_2, \dots, b_n are coefficient of the variables.

In this study, the dependent variable is employability skills of the engineering graduates from Hyderabad city, Independent variables are Personal factors (X_1), Life skill factors (X_2), Teaching learning factors (X_3), Evaluation and improvement factors (X_4) are discussed as follows:

- Dependent variable : Employability skills of the engineering graduates (Y)
- Independent variables :
 1. Personal factors (X_1)
 2. Life skill factors (X_2)
 3. Teaching learning factors (X_3)
 4. Evaluation and improvement Factors (X_4)

- Multiple R value : 0.772
- R Square value : 0.596
- F value : 192.799
- P value : 0.000**

Table 5: ANOVA(b)

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	9503.715	5	1900.743	192.799	.000(a)
Residual	6447.588	654	9.859		
Total	15951.303	659			

Table 6: Variables in the Multiple Regression Analysis

	Unstandardised Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error			
(Constant)	13.848	.697		19.880	.000**
Personal factors (X_1)	.023	.015	.053	1.500	.134
Life skill factors (X_2)	.033	.012	.101	2.634	.009**
Teaching learning factors(X_3)	.355	.024	.515	14.681	.000**
Evaluation and improvement factors (X_4)	.037	.029	.057	1.265	.206

The multiple correlation coefficient is 0.772 measures the degree of relationship between the actual values and the predicted values of the Adjustment. Because the predicted values are obtained as a linear combination of personal factors (X_1), Life skill factors (X_2), Teaching learning factors (X_3), and evaluation and improvement factors (X_4) the coefficient value of 0.772 indicates that the relationship between adjustment and the four independent variables is quite strong and positive.

The Coefficient of Determination R-square measures the goodness-of-fit of the estimated Sample Regression Plane (SRP) in terms of the proportion of the variation in the dependent variables explained by the fitted sample regression equation. Thus, the value of R square is 0.596 simply means that about 59.6% of the variation in adjustment is explained by the estimated SRP that uses combination of personal factors (X_1), Life skill factors (X_2), Teaching learning factors (X_3), and evaluation and improvement

factors (X_4) as the independent variables and R square value is significant at 1 % level.

The multiple regression equation is

$$Y = 13.848 + 0.023X_1 + 0.033X_2 + 0.355X_3 + 0.037X_4.$$

Here the coefficient of X_1 is 0.023 represents the partial effect of personal factors on employability skills of the engineering graduates from Hyderabad city as constant. The estimated positive sign implies that such effect is positive that adjustment score would increase by 0.023 for every unit increase in employability skills and this coefficient value is not significant at 5% level. Similarly for Life skills (X_2), and teaching learning factors affecting employability skills (X_3) has high level of impact is observed with coefficient values of 33 percent and 35 percent respectively and the values are highly significant at 1 percent level of significance. On the other hand, it is noted that, Evaluation and improvement factors affecting employability skills (X_4) recorded the coefficient at 0.37 represents positive and considerable level of effect on the employability skills of the engineering graduates and is not significant at 5% level of significance.

5.Summary and Conclusion

The results state that, there is a highly significant impact of life skills, teaching learning practices and evaluation systems and improvement chances to the engineering graduates has considerable impact on the employability skills of the engineering graduates in the sample. Hence, it is necessary to focus on design and development of practical oriented and application oriented teaching plans and instruct the students accordingly can help the students to realize the need for practical exposure and apply the same in industry. This can help to gain learning by experience and application. Employability is part of learning by experience and application of mind at different situations in business. This indirectly helps to develop the problem solving and decision making skills of the young graduates in the sample area.

References

- [1] Andreas Blom, H. S. (2011). "Employability and Skill Set of Newly graduated Engineers in India". World Bank.
- [2] Atkins, M. J. (1999). "Oven ready and self-blasting:taking stock of employability skills. Teaching in Higher education, Vol 4 No 2,pages 267-78.
- [3] Azami zaharim, e. (2009). "Employers perception towards engineering employability skills in Asia. WSEAS Transactions on advances in Engineering education, issue 6,vol.3, pp306-315.
- [4] Hassan B, M. Z. (2007). Future of engineering education in Malaysia. Ministry of higher education Malayasia.
- [5] Nguyen Danh Nguyen, Y. Y. (2005). University education and employment in Japan students' perception on employment attributes and implications for university education. Emerald group publishing , 202-212.
- [6] National Conference on Technical Vocational Education, Training and Skills Development: A Roadmap for Empowerment (Dec. 2008): Ministry of Human Resource Development, Department of Education, India.
- [7] India Today (2013). Clueless engineers: National Employability Report reveals how unemployable fresh engineering graduates are. Retrieved October 2013 from <http://indiatoday.intoday.in/story/national-employabilityreport-on-engineering-graduates-net-java-hcltechnologies/1/248970.html>.
- [8] First Post (2013). Unskilled, unemployed, angry: Is India Tomorrow headed for disaster? Retrieved October 2013 from <http://www.firstpost.com/india/unskilled-unemployedangry-is-india-tomorrow-headed-for-disaster-706054>.