

# Development of New Approach to forecast Probability of Placement in Software Companies for Fresher's

Vijay N Kalbande<sup>1\*</sup>, Chandrahas C Handa<sup>2</sup>, Arvind B Bodhe<sup>3</sup>, Amit W Bankar<sup>4</sup>

<sup>1\*</sup>Associate Professor, Mechanical Engineering, NIT Nagpur, M.S., India

<sup>2</sup>Professor & Head, Mechanical Engineering, KDKCE, Nagpur, M.S., India <sup>3</sup>Associate Professor, Mechanical Engineering, NIT Nagpur, M.S., India

<sup>4</sup>Assistant Professor, Mechanical Engineering, KDKCE, M.S., India

**ABSTRACT:** The researchers have made an attempt to develop a new approach to forecast probability of placement of fresh engineering graduates in Software Industries. Skills sets identified from literature review and validated based on stakeholder's opinion. The performances of engineering students on skill sets were recorded by conducting test. Software Package of Social Sciences version 20 is used to find correlation between skill sets and develop mathematical model to forecast probability of placement. The nonlinear relation of independent variable with dependent variable is converted into linear relation to develop model by using multiple regression analysis. Impact of input skill sets i.e. Aptitude, Communication, Technical and Personality skill factor on probability of placement was checked with the help of sensitive analysis. The study emphasized that the institute need to take special efforts for enhancing competencies in fresh engineering graduate to make them employable.

**KEYWORDS:** Fresh Graduate, Employability, Forecast, Probability of Placement.

## I. INTRODUCTION

Globalization in India has increased the demand of technocrats in corporate world. New institutes and second shift get started in year 2008 and 2010 to fulfill the requirements of future engineers [1]. The multifold growth of engineering institutes has directly affect quality of technical and neglect quality of fresh engineering graduate. As per the survey, 38 % of engineering undergraduates are employable for job in the information technology and enable services [2]. It is also found that only 7 % fresh graduates are employable when all skill sets factor are taken into count. [3]. India is on 53<sup>rd</sup> position where as Maharashtra state is on 14<sup>th</sup> position based on employability [4].

Today, the companies demand day one ready candidate from the institute to reduce burden of investment on training after recruitment [5]. Recently, corporate world is having multiple number of opportunity but they are not getting right skill set talent pool. The problem of low employment is not only the issue of engineering colleges but also industries as well as government at large

## II. Employability

The employability is an individual qualities and competencies to meet the changing needs of employers and customers which help to realize his or her aspirations and potential in work [6]. Individual capacity to achieve placement by considering personal circumstances and the corporate world position is called as employability [7].

The broadly the employability is an individual's ability to gain starting placement, maintain position, move between position within the same enterprise, and acquire new placement in market if required [8]. The meaning of employability in his research work is considered as ability to gain first placement in Software Company through campus placement recruitment process conducted in engineering college. The researcher is given more importance to recruitment of fresh engineering graduate through campus placement activities due to following reasons

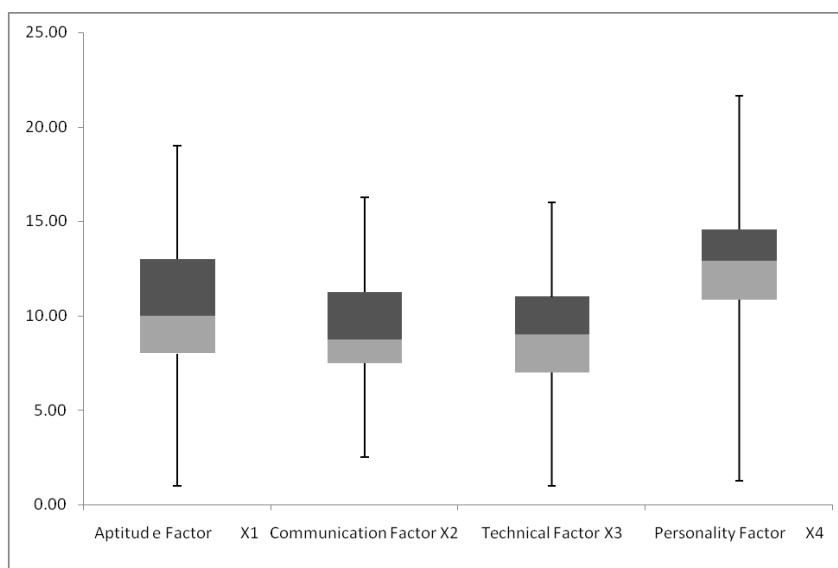
- Leading ranking agencies around the world are used success in campus placement as important criteria for ranking institutes & keep that information available on social websites.
- National Assessment and Accreditation Council (NAAC) and National Board of Accreditation (NBA) a self-governing body has given more emphasis on number of offer letters received in campus placement and activities run by institutes to enhance employability skills
- Parents preferred institutes which help their wards in providing placement opportunities in multinational companies.
- Multinational companies fulfill their 60-70 % entry level engineering graduate requirements by conducting campus placement drive.

- Based on previous year's placement record, industries decide the institutes to be visited for campus recruitment drive to recruit fresh engineers.

### III. Methodology and Data Collection

The research study is carried in RTM Nagpur University, Nagpur engineering institute. The opinion of the stakeholders considered for selection of skill sets and validation. Identified 22 employability skills were group into four major skill factors i.e. Aptitude, Communication, Technical and Personality skill set [9]. Standard questionnaires validated by the stakeholders. Pen and paper test design to conduct survey.

The performances of final year engineering graduates were measure by conduction test in various institutes. The questionnaire method is used to collect primary data and secondary data i.e. placement record of first 5 multinational software companies is collected from Training & Placement Department of respective technical institutes. The collected database filtered by using Box plot smoothing method for placed and unplaced group as shown in figure 1. Based on research study constraints and smoothing of data, the sample size reduces to 362 samples as shown in table 1.



**Figure 1 : Data smoothing by using Box Plot for placed group**

Sample No	Aptitude Score X1	Communication Score X2	Technical Score X3	Personality Score X4	Placement status (Y)
1	21	11	15	19	1.00
2	20	14	15	15	1.00
5	16	14	10	14	0.80
6	15	8	11	16	0.60
7	8	10	15	13	0.40
359	9	8	9	12	0.20
361	14	9	5	9	0.00
362	8	4	10	18	0.00

**Table 1: Students performance on skill sets along with Placement status**

IV. ANALYSIS AND MODEL FORMULATION

The analysis of final database conducted by using Statistical software SPSS version 20. The correlation between skill sets and with placement was found positive [10]. As per Kaiser,(1974) accepting value greater than 0.5 as barely acceptable; values between 0.5 to 0.7 are mediocre; value between 0.7 to 0.8 are good; value between 0.8 to 0.9 are great and value above 0.9 are superb. KMO & Bartlett’s Test is carried out to check adequacy & sphericity of 362 data samples and it is found 0.637 which is acceptable (mediocre range) as shown in table 2. The final tested dataset is used to develop mathematical model by using multiple regression analysis.

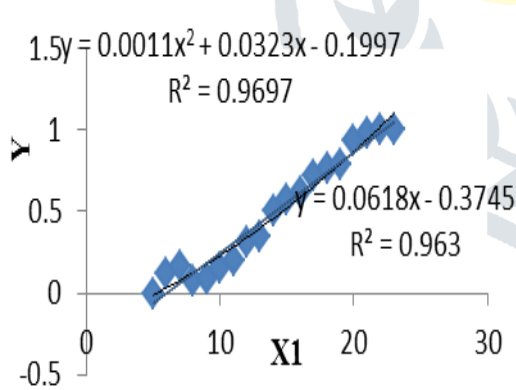
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.637
Bartlett's Test of Sphericity	Approx. Chi-Square	662.072
	Df	10
	Sig.	.000

Table 2 : KMO test of 362 sample dataset

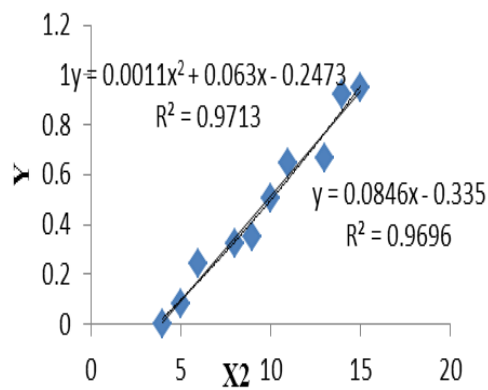
**Model formulation:** As per literature review, the researcher decided to use Multiple Regression to develop relationship between skill factors and employability (probability of placement) [11][12]. The mathematical correlation developed to forecast probability of placement based on skill sets of fresh engineering students. Skill sets are Aptitude  $X_1$ , Communication  $X_2$ , Technical  $X_3$  and Personality  $X_4$  as independent variables and placement  $Y$  as dependant variable. It is expressed as

$$\text{Placement } Y = f(X_1, X_2, X_3, X_4)$$

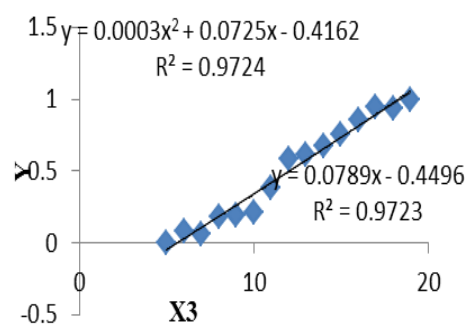
The assumption was made that the students selected in first, second, third, fourth and fifth are considered to be 100 %, 80%, 60%, 40% and 20 % probability of placement respectively. Hence the weightage allotted 1, 0.8, 0.6, 0.4, 0.2 for first, second, third, fourth and fifth attempt & 0 for unplaced. The research tried to plot graph between independent variable and dependent variable to find out relationship. It is observed that it is not possible to trace the equation due to non linearity relation between variable. The researcher converted nonlinear relation into linear relation and find out new  $Y$  value for each level of skill [13]. The graph plot between skills and calculated placement status to trace linear and polynomial relation as shown in graph 1,1,3,4



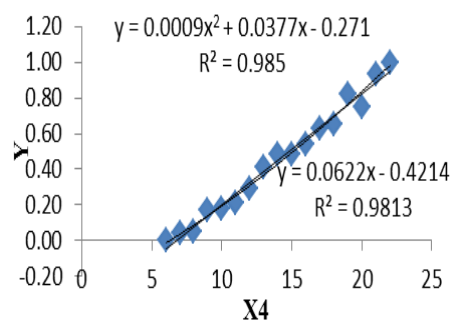
Graph 1: Aptitude  $X_1$  & Placement  $Y$



Graph 2: Communication  $X_2$  & Placement  $Y$



Graph 3: Technical  $X_3$  & Placement  $Y$



Graph 4: Personality  $X_4$  & Placement  $Y$

The coefficient of skill factor (independent variable with dependent variable) for linear and polynomial relation find out from graph 1, 2, 3 & 4 and calculate constant K &  $R^2$  for linear and Polynomial relation by using regression as shown in table 3.

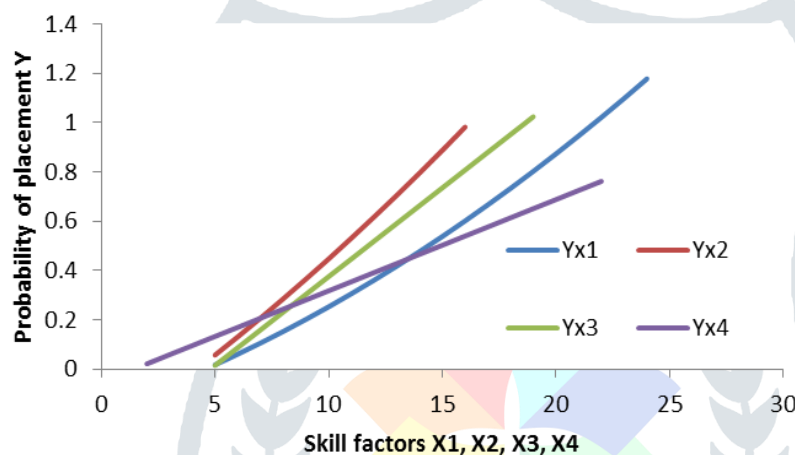
Model	Constant K	$R^2$
Linear model	-2.9029	0.2842
Polynomial model	-2.1883	0.7623

Table 3: Constant K and  $R^2$  for models

Since  $R^2$  for polynomial model is found more than linear model. This indicate than skill sets and placement is not having linear relationship. The further analysis carried out for polynomial model.

### Sensitive Analysis

Sensitive analysis is carried out to check impact of input skill factors on probability of placement. Calculate probability of placement  $Y_{x1}$  by changing Aptitude skill factor  $X_1$  and keeping other skill factor constant (Average value of  $X_2$ ,  $X_3$  &  $X_4$ ). Similarly calculate  $Y_{x2}$ ,  $Y_{x3}$  &  $Y_{x4}$  with respect to input skill factor Communication  $X_2$ , Technical  $X_3$  and Personality skill factor  $X_4$  respectively. Trace the graph between skill factors on X axis and probability of placement on Y axis as shown in graph e.



Graph 4: Skill sets ( $X_1, X_2, X_3, X_4$ ) and Placement ( $Y_{x1}, Y_{x2}, Y_{x3}$  &  $Y_{x4}$ )

It is observed that probability of placement is more sensitive with Communication skill factor  $X_3$  followed by Technical skill factor  $X_3$ . It means that the students need to focus on Communication skill factor  $X_1$  followed by Technical skill  $X_2$  on priority basis.

The above discussion can be summarized as follows

- Good at one skill factor cannot facilitate maximum probability of placement in software company..
- Communication skill factor is found more sensitive to change probability of placement as compare to others.

### V. CONCLUSIONS

All above discussion concludes that the institute needs to take special efforts to enhance competencies of engineering students to make them employable during four year engineering course. This model is useful to understand level of skills set required by software companies in campus placement recruitment process well in advance, which helps institute, students and trainers to work upon weak areas. It is also useful for employers to tap talent pool from untapped region and provide equal opportunities to fresh engineering graduates. Students need to focus on all four skill factors on priority wise to get early placement. Strong on one skill is not sufficient to keep them employable in corporate world. At the end knowledge of engineering and proficiency in English language are essential for the better employment of fresh engineering graduates.

### Acknowledgement

The authors acknowledge the help and support extended by stakeholder of campus placement activity conducted in technical institute's i.e Industries executives, senior T & P Officers, Trainers and alumni of BDCOE, Sevagram.

## REFERENCES

1. Manda Sreeram & Kumar Naresh (2012), Status of technical education in India- Emerging issues and challenges, Scribe digital library pp.67-72.
2. Bansal Amit (2010), CEO Aspiring Minds, 62% of engineering graduates needs training to be employable, BS Reporter / Mumbai August 17.
3. Aspiring Minds report on National Employability study IT/ITeS sector, 2014
4. PurpleLeap study, low employability skills among engineering students, in Andhra Pradesh, published in Reachout's News Bureau, 2009.
5. Gokuldas V. K. et al. (2011), Predictors of Employability of Engineering Graduates in Campus Drives of Indian Software Services Companies, published in International Journal of Selection and Assessment, Volume 19, Issue 3, pp. 313-319.
6. CANADIAN LABOUR FORCE DEVELOPMENT BOARD (1994) putting the pieces together: towards a coherent transition system for Canada's labour force. Ottawa: Canadian Labour Force Development Board.
7. CBI (CONFEDERATION OF BRITISH INDUSTRY) (1999) Making Employability Work: An Agenda for Action. London: CBI.
8. HILLAGE J. et al. (1998), Employability: Developing a Framework for Policy Analysis: London.
9. Kalbande Vijay et al., Identification of important parameters & skills required by Engineering students in campus placement process, International Journal of Engineering Research, Volume 3, S2, pp. 319-325, 2015.
10. Kalbande Vijay and Handa C.C. (2015), "Developing a model to predict Employability of Engineering students in Campus Placement for IT Sector" in International Journal of Advance Research in Engineering, Science & Technology (IJAREST), Volume 2, Issue 6, pp. 201-206, 2015.
11. Felder Richard M. et al (1993), A Longitudinal Study of Engineering Student Performance and Retention I. Success and Failure in the Introductory Course, Journal of Engineering Education, pp. 15-21.
12. Kalbande Vijay et al, "Predicting the Performance of Engineering students in Campus Placement for IT Sector by using ANN" in International Journal of Research and Scientific Innovation (IJRSI), Volume 3, Issue 2, pp. 109-113, February 2016.
13. Kalbande Vijay N. and Handa C.C. (2016), "Developing a Model to correlate Employability of Engineering graduate with Employability skill sets in Campus Placement for IT Sector" in Online International Interdisciplinary Research Journal (OIIRJ), Volume VI, Issue I, pp. 128-137, January 2016.