

PREDICT EMPLOYMENT POSSIBILITY OF TECHNO GRADUATES BY USING POLYNOMIAL MODEL

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Abstract

This paper made a attempt for identification of employability skill sets & developed mathematical polynomial model to predict employment possibilities in techno graduate students. Employment skill sets of students were identified. Regression analysis was used to develop correlation amongst employment possibilities of techno graduates with their skill sets information Technology sector organizations. Investigations carried out to find out level of employment skill sets and their impact on Employment. The best possible level of employment skills were identified based on opinion of stakeholders involved in recruitment process. Performance of techno students on identified skill sets collected by conducted pen & paper test. Tested dataset used to develop the polynomial model. The research concluded with that the technical institute should focus on skill sets during four year academic schedule and gave more importance on industry based activities.

Keywords: *Technical Graduate, Employment, IT Sector, Polynomial model.*

1. INTRODUCTION

Due to globalization, India has increased the demand of techno graduates. To fulfil the demand, AICTE, New Delhi has sanctioned new technical institutes within the same facility [1]. This unplanned growth in technical institutes has indirectly affected the quality of techno graduate students. Based on employment scenario, India is on 53rd place on global position and 14th place on state position [2]. Aspiring Minds study analysis; 62 % of technical graduates need systematic training to make them Job ready in IT Sector [3]. According PurpleLeap study analysis, only 7 % technical undergraduate students are found industry ready skills like Technical, Analytical & Communication [4]. Sunil Mani, Director, Centre for Development Studies (CDS), Thiruvananthapuram, pointed that One out of two graduates is still not employable. A. Ajaya Ghosh, Director, CSIR–National Institute for Interdisciplinary Science and Technology (NIIST) said that our school and higher education institutes needs to change from theoretical learning to practical approach.

All above studies on employment, demands to work on employability area & taking small initiative in this regards will play a significant role. Presently market scenario offers lot of opportunities for the placement, but seriously lack the skill sets among the students. The issue of low skill sets in techno students is not only the issue of institutes but also the concern of companies as well as Government. This demands the research need to carried out and develop tool to measure placement & level of skill sets demanded by the Industry. Literature review was carried to identify skill sets and Rashtrasant Tukadoji Maharaj Nagpur University Technical institute selected for the research study

2. RESEARCH GAP

The research gap was identified through exhaustive literature review. It is observed that a) the researchers investigated the full range of skills affecting the employment of techno students. b) Few researchers concluded the facts based on stakeholder's opinion about student's employment in campus selection process. c) Other researchers were focuses on updating the quality of techno graduates by applying management tools [6][7][8][9]. d) No one develop practical model to measure employment chances of techno students. This proposed research work has attempted to identify employment skill sets and develop polynomial mathematical model to measure chances of employment in IT Sector. The researcher established correlation between skills sets i.e. Aptitude, Communication, Technical & Personality skill sets with Employment as mathematically expressed as follows

Employment $Y = f(\text{skill sets})$

Employment $Y = f(\text{Aptitude, Communication, Technical \& Personality skill sets})$

3. DATA COLLECTION

The author has made attempt to develop systematic approach to measure placement of technical graduate students in IT Sector. Campus recruitment process of technical institutes was considered for collecting samples for the research work. Company executives, Placed alumni, senior Training & Placement officers & corporate trainers were used to validate identified skill sets and methodology to measure them. Identified skill sets further categorized into four major category of skill sets as shown below,

Aptitude skills: X1

Logical thinking

Problem solving

Visualizing

Analytical

Mathematical

Business awareness

Communication skills: X2

Written communication

Presentation

Reading

Listening

Oral communication

Technical skills: X3

Subject concept knowledge

Basic computer knowledge

Application of technical knowledge

Personality skills: X4

Positive attitude

Team work

Leadership

Flexibility

Creative/Innovative

Self-motivated

Self confidence

Goal setting

Pen & paper method used to collect the performance of techno graduate students on selected skill sets. Questionnaires designed on each skills and validated by stakeholders. The systematic designed test was conducted in Rashtrasant Tukadoji Maharaj Nagpur University Technical institutes. The database of 2000 plus techno students were collected. The employment record of same techno student's & number of attempts required to get employment within first 5 companies were collected from respective institutes. Finally 362 samples selected after considering limitations of the research work and data smoothening technique Box Plot.

4. DEVELOPMENT OF POLYNOMIAL MODEL

Descriptive statistics, Chi square test, T-pair test. One way ANOVA analysis by using SPSS version 20 carried out to investigate the facts of skill sets and their impact on employment. The KMO & Bartlett's Test was used to check the adequacy & sphericity of 362 samples [10]. The correlation between skill sets i.e. Aptitude X1, Communication X2, Technical X3 & Personality X4 with Employment was established by using multiple regression analysis. The polynomial model was developed to predict Employment possibilities with their skill sets as shown below.

$$\text{Employment } Y = f(X1, X2, X3, X4)$$

As per trend in technical institutes, all reputed multinational IT Sector industries desire to visit institute in day one slot to get best talent. No on reputed company shows interest to visit after 5th slot. T & P officer is also tried to train technical students to place in first 5 IT Sector MNC to achieve maximum placement. Most of the companies is having eligibility criteria above 60 % throughout in the academics starting from SSC result. Hence, the students selected in first five companies considered as placed & other considered as unplaced.

In this research work, the assumption was made that the students received employment in First, Second, Third, Fourth, Fifth chances considered to be 100 % , 80 % , 60 % , 40% , 20 % Employability respectively & other participated but not received employment are consider to be 0 % Employability. Hence the weightage was allotted based on chances i.e. 1, 0.8, 0.6, 0.4, 0.2 for 1st, 2nd 3rd 4th & 5th chance & 0 for unplaced. Collected primary and secondary database recorded on Ms-Excel and curve fitting done on each skill set separately with Employment as shown in Figure 1, 2, 3 & 4.

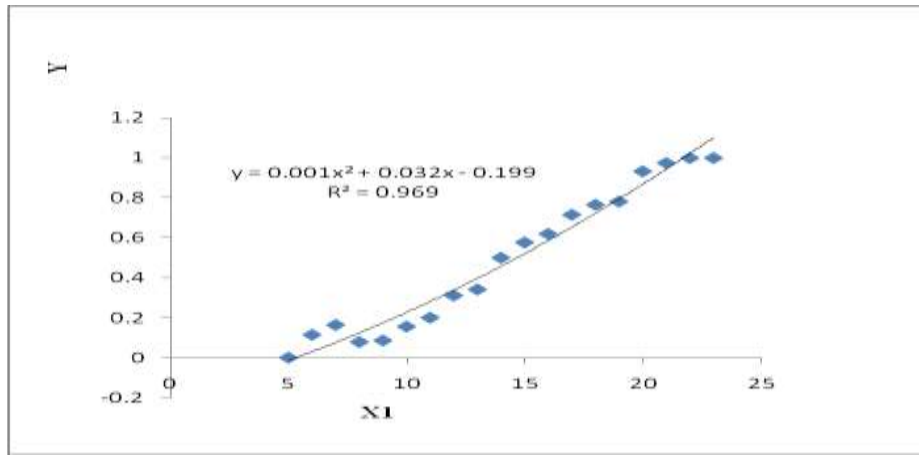


Figure 1: Aptitude Skill X1 & Employment Y

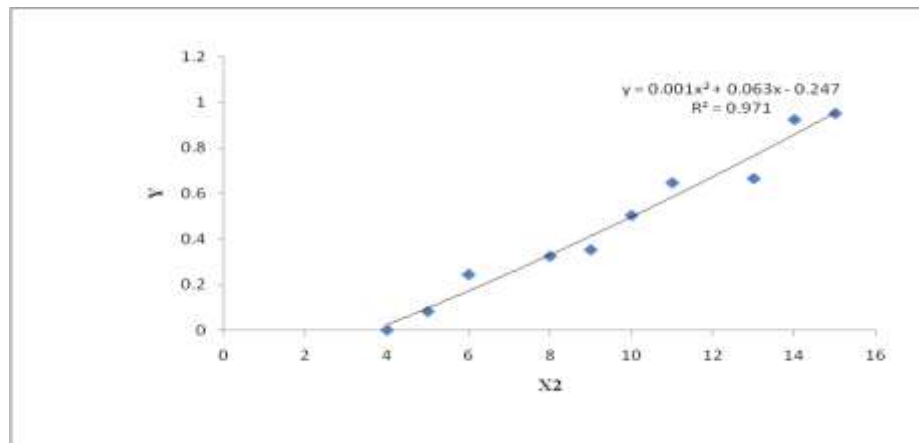


Figure 2: Aptitude Skill X2 & Employment Y

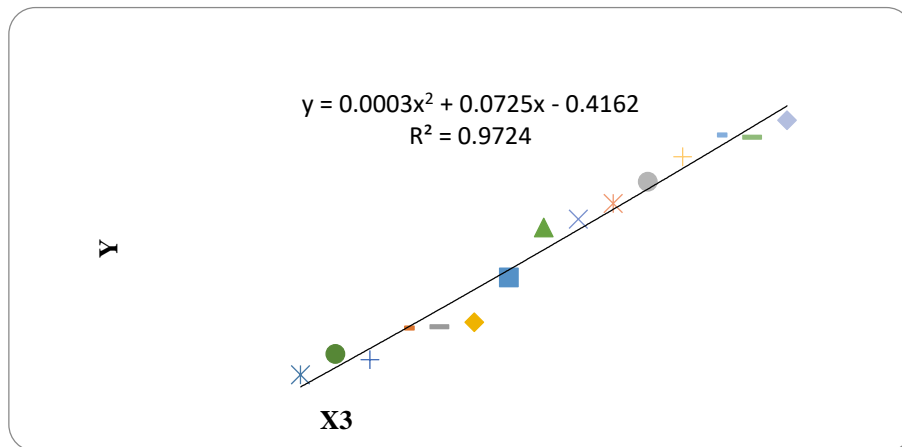


Figure 3: Aptitude Skill X3 & Employment Y

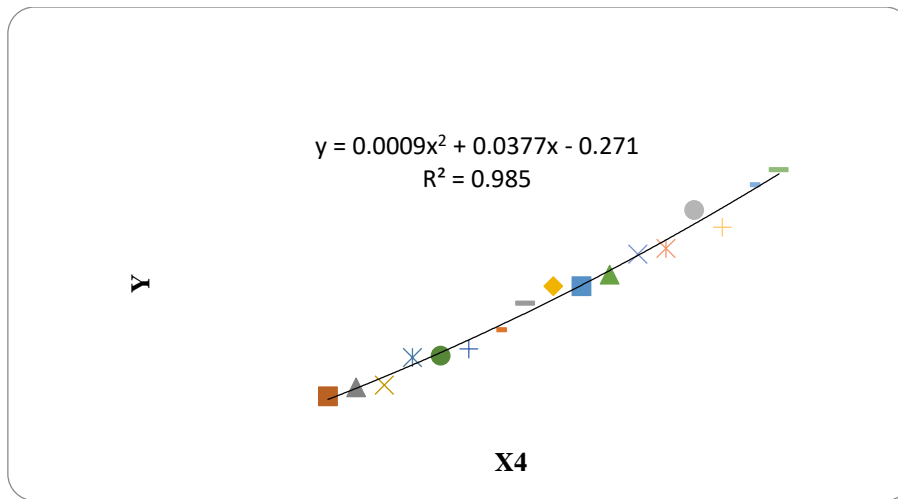


Figure 4: Aptitude Skill X4 & Employment Y

From figure 1, 2, 3 & 4, coefficient constant of each skill sets variable were noted and calculates constant K & R² for the polynomial model after considering all skill sets by using conceptual method as shown in Table 1

Table 1: Calculation of constant K & R² for polynomial model

X1	X2	X3	X4	Y	K	Ypred	Residue	Sq Resi	Y-Ybar	Y2-Ybar
15	15	18	15.83	1	2.7568	1.1517	-0.1517	0.0230	0.5362	0.2875
15	10	19	18.33	1	2.4813	1.1466	-0.1466	0.0215	0.5362	0.2875
16	13.8	17	17.92	1	2.7102	1.1277	-0.1277	0.0163	0.5362	0.2875
6	7.2	5.23	10.83	0	1.1671	1.0063	1.0063	1.0126	-0.4638	0.2151
11	4.25	5.12	9.58	0	1.4379	1.0243	1.0243	1.0491	-0.4638	0.2151
			K		2.1883	0.0856		77.807		59.313
						R ²	0.7623			

The polynomial model with R² – 0.7623 is mathematical written as follows

$$Y=0.001X1*X1+0.032X1+0.001X2*X2+0.063X2+0.078*X3+0.062*X4-2.1883$$

Employment skills show reasonable strong correlation with each other. Aptitude & Communication skill follow polynomial relations with Employment whereas Technical Personality skill follows linear relation. The focus on one skill set is not enough to raise employment upto 100 %. It is also observed that each skill set have its lower limitation, it means students need to keep performance on each skill sets to raise chances of employment. With the help of this model, techno students can check their preparation before participation in actual campus placement recruitment process. The model was validated by using Artificial Neural Network technique in MATLAB [11]. The summary of validation process as shown in table 3.

Table 2: Validation of model by using ANN

Overall R2	0.9428
Training R2	0.9583
Validation R2	0.9075
Testing R2	0.9200
Mean Square Error	0.0294
No of neurons	20
No of Hidden layers	2
Skill sets value	4 (X1,X2,X3,X4)
Employment Possibility	Y

5. SENSITIVE ANALYSIS

Impact of each skill set on Employment possibility was checked by doing sensitive analysis. Average performance of techno students was calculated from collected database and varies one skill set from minimum to maximum by keeping other 3 skill set value constant. Minimum, Maximum and Average value of all skill set are as shown in table 3.

Table 3 : Average values of each employment skills

Employability Skills	Minimum Value	Maximum Value	Average Value
Aptitude Skill (X1)	5	22	13.5
Communication Skill (X2)	4	16	10
Technical Skill (X3)	5	19	12
Personality Skill (X4)	6	21	13.5

Aptitude skill set (X1) varies from minimum to maximum by keeping other skill constant i.e. average value (X2=10, X3=12, X4=13.5) to calculate Employment possibility Y_{x1} . Same way calculate Employment possibility for Communication, Technical & Personality skill set and plot graph between skill sets and employment possibility as shown in figure 5.

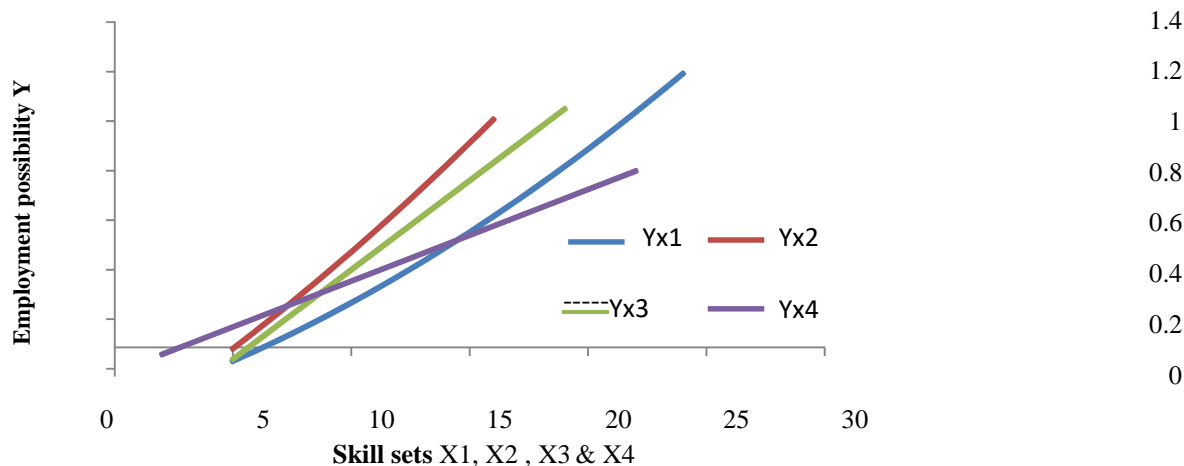


Figure 5: Impact of skill sets on Employment possibility

From figure 5, the Employment possibility is more sensitive with Communication skill set X3 followed by Technical skill set. The students need to concentrated more on Communication skill set X1 followed by Technical skill set X2 on priority basis. Aptitude skill set is a deciding factor to get early placement in IT companies.

6. CONCLUSIONS

The research concluded with that the technical institution should make more efforts to concentrate on skill sets during academics. Techno students can used this model to predict employment possibility and weaker area. They will work on weaker areas well in advance to get early employment. It may use by Employer to search hidden techno talent from untapped area to give opportunity at entry level. The findings of this research work also help to institutes, trainers, students to make strategy of enhancing employment skill set for getting early employment in institute recruitment process.

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