A Study on Corporate Perceptions on Employability skills of Engineering Graduates in Information Technology Industry based on Gender

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Abstract: *In India, there are 104 males for every 100 females making the male-to-female ratio (MFR)1.04.In contrast, the Male Female ratio in IT/IT Services companies is about 3.54.Even the ratio of males and females in the national workforce is about 2.57(based on Data Quest's Best Employer Survey 2012).This shows that fewer proportion of female engineers are employed in IT/IT sector. Based on a survey done by Aspiring minds, it showed lower percentage of female engineers being recruited to Software engineer roles in the industry. While many factors have been attributed for this such as lower proportion of females opting for a professional career; females not being comfortable with relocation; preference of males by corporations; biases in hiring processes etc. There was a need to understand if employability skills of male and female candidates affect their hiring process as well. This paper tries to understand if there is a significant difference in the employability skills of male and female candidates while leads to lower hiring proportion of female engineers.*

Key Words: *Employability skills, Information technology, engineering graduates, gender.*

1. INTRODUCTION:

Employability can be defined as an individual's ability and skills to get work done effectively. Both ability and skills would vary from person to person. The skills involved can be called as employability skills. Employability is mainly focused on a person's skills, knowledge and attitude. These are the skills, which develop the attitude and action in the person which enable him to work along with his fellow workers and supervisors and these skills develop him so that he can take initiative and make critical decision (Robinson, 2000).

Employability skills are referred to as generic capabilities, transferable skills, basic skill, essential skills, work skills, soft skill, core skills, core competencies and enabling skills or even key skills (DEST 2007). Gowsalya and Ashok (2015) identified the important employability skills in the IT field. These skills are: foundational professional skill in core domain, knowledge of technology, communication skills and aptitude for chosen work. Masura, H., (2012) revealed that the relationships between employability and graduates' perception of their own skills. The study suggests identify whether the level of skills possessed by graduates during their studies are appropriate in helping them to perform in the current job market.

2. BACKGROUND:

The employability skills are the optimum combination of various skills namely technical;inter personal, communication, specific and initiative skills (Hillage and Polland, 1998). In the present study, the variables included to measure the employability skills are twenty-eight skills which were drawn from the reviews (Nabi, 2010; Clarke, 2008; Cox and King 2000) in engineering education. These are presented in Table 1.

TABLE 1
Employability Skills in Engineering Education (EEE)

Sl.No.	*Variables in EEE*	*Sl.No.*	*Variables in EEE*
1.	Development of self discipline	15.	Organizing skills
2.	Creativity	16.	Problem identification and solution
3.	System designing	17.	Effective communication
4.	Development of orderly skill	18.	Innovation
5.	Information management	19.	Application of mathematics in engineering
6.	Function with multi disciplinary teams	20.	Team building
7.	Adapting to Requirement changes	21.	Understood professional ethics
8.	Process designing	22.	Commitment
9.	Imitativeness	23.	Leadership ability

10.	Strategic thinking	24.	Application of science in engineering
11.	Resolve conflicts	25.	Co-ordination
12.	Responsiveness	26.	Risk taking ability
13.	Solving engineering problems	27.	Social responsibilities
14.	Documentation	28.	Adapt to new environment

The employers are asked to rate these variables at five point scale on the basis of their perception of male students and female students at present

3. OBJECTIVES OF THE STUDY:

This study aims to further an earlier research on Employability by the authors N Rajsekar, A Kurup(2016) and find the perceptions of employability skills of the Engineering graduates based on their gender. The methodology and skills identified have been kept the same. The study aims to find if male or female candidates are better employable in the IT industry based on perception of their IT employers and in which skills the difference between them is significant.

4. METHOD:

The population of the present study is the registered IT companies in and around Mumbai. In total, there are 342 IT registered companies at Mumbai. The sample size of the study was determined by the formula of $n=N/Ne^2 + 1$ (Slovin, 1960). It came to 184 IT companies. The judgment sampling was adopted to distribute the samples among the population. The structured questionnaire was used to collect the primary data from the sampled companies.. The HR managers of the IT companies had to evaluate the engineering graduates on a Likert scale of 1 to 5 based on their perception of their employability skills. The response rate on the questionnaire was only 60.87 per cent. The collected data were processed with the help of SPSS.

5. ANALYSIS AND DISCUSSION:

The score of all 28 variables in employability skills have been included for exploratory factor analysis in order to narrate the variables into factors. Initially, the validity of data for factor analysis has been conducted with the help of Kaiser-Meyer-Ohlin (KMO) measure of sampling adequacy and Bartlett's test of sphericity. The executed factor analysis results in five important employability skills. The Eigen value and the per cent of variation explained by each important employability skills are shown in Table 2.

TABLE 2
Important Employability Skills (IES)

Sl. No.	*IES*	*Number of variables in*	*Eigen value*	*Per cent of variation explained*	*Cumulative per cent of variation explained*
1.	High order thinking skills	6	5.8969	21.06	21.06
2.	Interpersonal skills	6	5.0442	18.01	39.07
3.	Personal skills	6	4.3093	15.39	54.46
4.	Problem solving skills	5	3.8117	13.61	68.07
5.	Technical skills	5	3.0933	11.04	79.11
KMO measure of sampling adequacy: 0.8142			Bartletts test of sphericity: Chi-square value: 103.49*		

*Significant at five per cent level.

The first two important employability skills identified by the factor analysis are high order thinking skills and interpersonal skills since its Eigen value are 5.8969 and 5.0442 respectively. The per cent of variation explained by these two skills are 21.06 and 18.01 per cent respectively. The last three important employability skills noticed by factor analysis are personal, problem solving and technical skills since its Eigen value are 4.3093, 3.8117 and 3.0933 respectively. The per cent of variation explained by these three skills are 15.39, 13.61 and 11.04 per cent respectively. All these five important employability skills are included for further analysis.

Reliability and Validity of Variables in Employability Skills

The score of all variables in each employability skills have been included for confirmatory factor analysis in order to examine the reliability and validity of variables in each employability skills. The Cronbach alpha of each employability skills have been estimated . The results are illustrated in Table 3.

TABLE 3
Reliability and Validity of Variables in Important Employability Skills

Sl. No.	*Important employability skills*	*Range of standardized factor loadings*	*Range of 't' statistics*	*Cronbach alpha*	*Composite reliability*	*Average variance extracted*
1.	High order thinking skills	0.8911-0.6517	3.9843*-2.4518*	0.7886	0.7646	54.91
2.	Interpersonal skills	0.9044-0.6336	4.0894*-2.3441*	0.7903	0.7726	55.18
3.	Personal skills	0.8566-0.6401	3.5939*-2.3898*	0.7514	0.7311	54.17
4.	Problem solving skills	0.9211-0.6273	4.1173*-2.2673*	0.7979	0.7193	52.11
5.	Technical skills	0.8433-0.6229	3.4042*-2.4317*	0.7317	0.7193	52.11
	Total	0.8969-0.6229	4.0092*-2.2411*	0.7802	0.7701	54.02

*Significant at five per cent level.

The standardized factor loadings of variables in each employability skill are greater than 0.60 which reveals its content validity. The significance of 't' statistics of all variables in each employability skill reveal its convergent validity. It is also proved by the composite reliability and average variance extracted since these are greater than its standard minimum of 0.50 and 51.00 per cent respectively. The cronbach alphas of all five employability skills are greater than its minimum threshold of 0.60. All these results indicate its reliability and validity.

Employers Perception on Variables in Higher Order thinking Skills (HOS)

The employer's perception on Higher order thinking skills have been discussed by the computing the mean score of the level of perception on all six variables in HO thinking skills based on gender. 't' statistics has also be computed at 5% level of significance. The results are summarized in Table 4

Table 4
Employers Perception on Variables in Higher order Thinking Skills (HOS)

Sl.No.	*Variables in HOS*	*Gender*		*'t' statistics*
		Female	*Male*	
1.	Strategic Thinking	2.9491	3.0117	-0.1393
2.	Creativity	3.1334	3.0454	0.3919
3.	Application of Maths	3.2997	2.8804	2.1408*
4.	Application of Science	3.0267	2.6673	2.0073*
5.	Understood ethics	3.4083	3.0117	2.0142*
6.	Innovation	3.0117	2.9491	0.1393

*Significant at five per cent level.

Female engineers have shown significantly higher ratings in High order skills in applications of science & maths and in the understanding of ethics in organizations.
Similarly employers perception on other four skills are computed based on gender

Table 5
Employers Perception on Variables in Interpersonal Skills (IPS)

Sl.No.	*Variables in IPS*	*Gender*		*'t' statistics*
		Female	*Male*	
1.	Leadership	2.8686	2.9676	-0.4966
2.	Team building	3.0393	2.9697	0.2118
3.	Co-ordination	3.7886	3.8421	-0.3117
4.	Responsiveness	3.2088	2.9945	0.7891
5.	Effective Communication	3.2541	2.8117	2.3964*
6.	Functioning with other teams	3.6143	3.9969	-1.4046

*Significant at five per cent level.

Female engineers have shown significantly higher ratings in Interpersonal skill of effective communication.

Table 6
Employers Perception on Variables in Personal Skills (PES)

Sl.No.	*Variables in PES*	*Gender*		*'t' statistics*
		Female	*Male*	
1.	Self Discipline	3.1845	3.0456	0.2731
2.	Orderly	3.4082	3.0496	2.1143*
3.	Commitment	3.4541	3.0148	2.2734*
4.	Organizing	3.1889	3.0226	0.3089
5.	Risk taking ability	2.6604	2.9673	-1.2545
6.	Social Responsibility	3.2451	2.8667	1.9969

*Significant at five per cent level.

Female engineers have shown significantly higher ratings in Personal skills like being orderly and showing commitment to organization.

Table 7
Employers Perception on Variables in Problem Solving Skills (PS)

Sl.No.	*Variables inPS*	*Gender*		*'t' statistics*
		Female	*Male*	
1.	Resolve conflicts	3.0117	3.2672	-0.4296
2.	Solve Engineering problems	3.0972	2.9969	0.4119
3.	Imitativeness	3.0667	2.9942	0.2882
4.	Problem identification and solution	3.2773	3.1884	0.1381
5.	Adapt to new environment	3.0456	3.1845	-0.2731

*Significant at five per cent level.
No significant difference is observed in any of the problem solving skills variables.

Table 8
Employers Perception on Variables in Technical Skills (TS)

Sl.No.	*Variables in TS*	*Gender*		*'t' statistics*
		Female	*Male*	
1.	Information management	3.1084	3.2441	-0.3914
2.	System designing	3.1085	3.3886	-0.4088
3.	Process designing	3.2118	3.3886	-0.2676
4.	Documentation	3.1884	2.8684	1.3961
5.	Requirement changes	3.2196	3.0117	0.4193

*Significant at five per cent level.

No significant difference is observed in any of the technical skill variables.

6. CONCLUDING REMARKS OF THE STUDY:

The present study concludes that of the five important employability skills in IT industry namely high order thinking, interpersonal, personal, problem solving and technical skills, female engineers have been rated significantly higher than their male counterparts in application of science & maths , understanding of ethics in organizations, effective communication and personal traits like being orderly and committed to the organization. Though male engineers have performed better than female engineers in some skills, the difference is not significant to influence hiring patterns in organizations. Hence we could conclude that lower employability skills cannot be the reason for the lower proportion of female engineers in IT companies.

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