CHAPTER II

REVIEW OF LITERATURE
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2.1 INTRODUCTION

Today's job market needs the people with good knowledge and who can increase the value of the organization. A big movement from production related jobs to software jobs highlights the need for the candidates, who are strong in core knowledge related to IT (Information Technology) field. Employability means not only getting the job, but to retain the job for future also. For that the candidate needs to update their skills with the changing environment. What are the major skills needed to get employment, in this regard so many studies and research papers were published. Most of the studies tell about the hard skills and soft skills. Hard skills include the technical knowledge related to their field and soft skills includes communication, writing skills and listening skills etc.

2.2 STUDIES ON EMPLOYABILITY OF GRADUATES IN INDIA

Backthavatchalu (2005) [32], in his study concentrated on the preparation of the syllabus for engineering students in the area of non-technical skills in Tamil Nadu. The study is based on analysis of syllabus of engineering students, the role of non-technical skills in getting the employment. Concluded that non-technical skills plays an important role to get employment and suggested to the management to focus on it.

Agarwal (2006) [33], focused on the holistic development of the individual in all aspects, should not concentrate only on employment. An engineer should concentrate on the product quality, specification and along with that the environmental effects and creating a healthy competition in the industry. Finally, suggested to have industry interaction frequently and develop soft skills also.

Various researchers did their survey on the situation of the Indian Engineers and most of them agreed with the common problems, which are explained with the
help of the following diagram. The common problems faced by Indian Engineers[34] are lack of programming and algorithm skills with 91.82% graduates, 71.23% graduates have lack of soft and cognitive skills, 60% of graduates lack domain skills, 73.63% engineers lack English speaking and comprehension skills and 57.96% engineers have poor analytical and quantitative skills.

**Fig. No.3: Problems with Indian Engineers**

![Problems with Indian Engineers](image)

*Source: askIITians.com*

These problems are seen with every engineer. To overcome these problems, the college management people, should conduct placement and training programs from the 3rd year of their engineering studies, so that they will be ready at the time of placement drive.

India, every year, produces approximately 15 lakhs of engineers from different fields. In that most of them are unemployable because of lack of skills. If, an IT student writes a program with 15 to 20 lines, and an ECE student assembles a circuit properly, they will get the job. Even then, most of the graduates are not able to cope up with these skills. This is because of so many reasons. In the Business Today, an
article given by Mr. Varun Aggarwal of Aspiring Minds [35], highlights the need for the employability skills among the engineering graduates. From the figure 2.1, it is clear that 30 – 40 percent of engineers are in BPOs and other related jobs. Only 2 – 4 percent of graduates are getting jobs as a Software Engineer.

**Fig. 4**

A Report on Employability of Engineers & Roles

This clearly indicates that most of the engineering graduates are joining in BPOs or ITeS, Sales engineers, Creative Content Developer, Business Analyst, etc. This shows that most of the engineering graduates are lacking behind of technical skills and coding skills. The employability ratio between male and female are almost all equal, only a little bit difference can be seen. In some areas like Associate ITeS/BPO, female are more than males. As a sales engineer (non IT) and also as Creative Content Developer the female ratio is more. With this we can say that men and women are equally competing with each other in securing the jobs.

AICTE in its Report of India Skills, 2018[36], says that Karnataka stood first in providing employment opportunities to the fresh Engineers. Highest employability we can see in Andhra Pradesh, Delhi, Gujarat and Karnataka. The cities which
provide more employment are Bangalore, Chennai, Indore, Lucknow and Mumbai. In this report they mentioned that 52% employment in there in the fresh engineering graduates. In that the IT and CSE graduates are getting more jobs and Civil Engineers are getting very less jobs, this is because of huge demand for IT related jobs. The following table clearly explains the present situation of Indian Engineers in relation to employment opportunities.

Fig.-5
Report of India Skills 2018

2.3 EARLIER STUDIES ON SKILLS, COMPETENCIES, AND EMPLOYABILITY:

Padmini. I (2012) [37] in her study entitled -Education Vs Employability- The Need To Bridge The Skill Gap Among The Engineering And Management Graduates In Andhra Pradeshl would like to know the skills needed by management graduates to get the employment and what is the role of the government in skill development by making necessary changes in the syllabus and curriculum of professional graduates.

Divya Shukla (2012) [38] in her study entitled -Employability Skill among Professionals – Chagrin of HR Executives in Indian Labor Market: A Study on Engineering Graduates of Bhopalll stress the importance of apprenticeship for students and live projects will help the graduates to get required job without wasting their time after graduation.

Poornima Jain (2013) [39] in her study entitled -Globalization And Developing Employability Skills: Challenges And Their Solutions With Reference to National Policy of Skill Development (NPSD) & Government’s Action Plan And Role Of Life Long Learning And Extension(LLLE) Departmentsl would like to concentrate on the programs taken by the government in developing employability skills and how they are working towards the employability problem. This study suggested some measures like interactive sessions between Government and Universities to make a common program, which will benefit both the policy makers and job seekers.

Chithra. R (2013) [40] in her study entitled -Employability Skills -A Study On The Perception Of The Engineering Students And Their Prospective Employers” concentrated to know what an employer looks for and what are the skills needed by the entry level jobs. Come out with a conclusion that the students who have experience in the work culture are getting the jobs easily when compared with the students who do not have any practical exposure.
Hari Prasad N et.al (2014) [41] in his study entitled “Alarming Employability Skills Deficiency among Budding Engineering Graduates – A Study On Engineering Graduates In Chittoor District,” focused on the training programs and their role in developing the employability skills among the graduates. Finally suggests that group discussions and good networking skills will help the students to get employment.

National Employability Enhancement Mission (NEEM), was introduced by the Central Government to offer on the job practical training and framed National Skill Qualification Framework (NSQF) to increase the employability skills of the young graduates. This program helps to provide internships to the students.

2.4 STUDIES ON STUDENT PERCEPTIONS OF EMPLOYABILITY SKILLS:

Groot & Brink [42] talked about the current socioeconomic positions in Europe that are dominated by the belief that the labor market should become more flexible by investing in education and train when they are working, so that they improve the flexibility of workers. Their human capital theory puts light on the important aspect, that we deal in this research was about investments in training, education & making people more employable. The people that work in organizations nowadays need to be multi-skilled in order to be employable for more jobs within the organizations as well.

Tiwari Anoop Kumar [43], Rosenberg et al (2012) [44] and others did their survey on the perceptions of the students in getting employment. The main points in these studies reveal that familiarity with the idea of employability skills to the students as well as to lecturers is important to develop those skills among the students. Organizing specific activities, which will increase the skills required by the industries. Language plays an important role in getting the job.
A study conducted by Nguyen, (2005) [45] - Engineering Survey on _Engineering Students Perceptions on Important Employability Skills' shows that the students should have the personal skills like communication skills, problem-solving

**Fig.- 6**

**Students’ Perceptions on Employability Skills**

<table>
<thead>
<tr>
<th>No.</th>
<th>Personal skills</th>
<th>Attitudes</th>
<th>Traits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Communication skills</td>
<td>Responsibility</td>
<td>A balanced personality</td>
</tr>
<tr>
<td>2</td>
<td>Problem-solving skills</td>
<td>Cooperation (Work in team)</td>
<td>Initiative</td>
</tr>
<tr>
<td>3</td>
<td>Goal-setting skills</td>
<td>Desire for challenge</td>
<td>Flexibility</td>
</tr>
<tr>
<td>4</td>
<td>Personal presentation skills</td>
<td>Vitality</td>
<td>Sincerity</td>
</tr>
<tr>
<td>5</td>
<td>Visioning skills</td>
<td>Curiosity</td>
<td>Creativity</td>
</tr>
<tr>
<td>6</td>
<td>IT and computer skills</td>
<td>Ambition</td>
<td>Individuality</td>
</tr>
<tr>
<td>7</td>
<td>Leadership skills</td>
<td>Optimism</td>
<td>Sensitivity</td>
</tr>
<tr>
<td>8</td>
<td>Self-assessment skills</td>
<td></td>
<td>Entrepreneurial mind</td>
</tr>
</tbody>
</table>

Sources: Nguyen (2005);

skills, goal-setting skills, personal presentation skills, listening skills, IT and computer skills, leadership skills and self-assessment skills. In that survey students expressed their attitudes and traits in developing the employability skills.

One of the most important aspects of education is an application of knowledge and how can the need for betterment be analyzed without testing the knowledge that has been gained from valuable sources. The researcher wants to highlight in the above paragraphs that there are no such courses or programs that path the employability of the student's past studies of degree level education, nor an examination of what is needed to boost employability in India. The researcher feels the whole idea behind educating people is not just bookish knowledge that can be kept home and utilized during the examinations, it’s about meaningful knowledge how can be put to productive utilization by trying to bridge the gap of communication, interacting with people leading by examples or keeping an open mind towards the development of teamwork. In the 21st century, only conventional ways of mainstream education that tests only academic quality or it may not suffice for the development that we are looking at the global changes around the world [46].
There is a terrible need to understand and analyze how, and what would be good enough to add and create leaders who will lead businesses and an education system that will support the students and graduates to face new challenges with affirmative attitude and high regards for continuous development in their respective fields. The real world around us has so many things that are not enclosed in the books and in theory which can only be gained through knowledge and exposure. This study will not only help and guarantee advancements in the curriculum of different programs, but also gives practically how important it is.

2.5 EMPLOYABILITY SKILLS IN OTHER COUNTRIES

Curtis and McKenzie (2002) [47] did their work on Australian Industry to reduce the gap between the education system and employers. The study tries to understand the existing problems and gave suggestions how to overcome those hurdles.

Hodges and Burchell (2003)[48] conducted their survey in New Zealand and recognized that 25 basic skills are needed to get employment. Most of the survey reports highlight that teamwork, interpersonal skills, soft skills, problem solving skills and technical skills are very important in getting the employment.

Awang et al., (2006) [49] studied about what are the skills required for engineers to get a job in Malaysia. The study reveals that work-related attitude, self-management, teamwork culture, creative thinking and communication plays an important place in getting the employment.
Fig No.7: Qualities needed by Global Employers in graduates

A survey, conducted by the Global University Employability, 2017 [50], tells that globally all the industries need the skills mentioned in the above figure and expressed their satisfaction levels with the present engineering graduates. The graduates are having more than 60% of skills related with communication, Collaboration, Social awareness and adaptability to the work culture. Graduates should improve their skills in all the areas mentioned above and a special care should be taken in the areas like problem solving, creativity and leadership skills, where the required skill rate is high and the graduates lagging behind of it.

2.6 STUDIES ON ROOT CAUSES FOR EMPLOYABILITY ISSUES OF ENGINEERING GRADUATES

The research work done in analyzing the reasons or proposing solutions to the employability or Skill Gap largely ends-up in addressing "Soft Skills" as a major contributor reported ((Andreas Blom2011)[51], (Padmini2012) [52], (Divya2012) [53], (Chitra2013) [54], & (Rajeev 2012) [55]). But the employability issues as a defect from the qualified engineering graduates are not only due to Soft skills alone, but also due lack of hard skills. Hard skills are also addressed as domain skills by the Industry. This domain / hard skill has been recognized as a need for improving
employability apart from soft skills and was named as specific Skills (Andreas Blom 2011) [51].

### 2.7 STUDIES ON SIX-SIGMA METHODOLOGY IN EDUCATIONAL INSTITUTIONS

Educational Institutions implementing Six Sigma methodology, is not completely new, as found from the works of literature and briefed below. But it has been found from the works of literature that none of them attempted to provide the model for addressing the employability of engineering graduates, which is most important Critical to Quality (CTQ) [56] definition for the survival of academic Institutions. As quantified (Rajiv 2012) [57], the un-employable engineering graduates in 2012 were 375,000 in India. It is also predicted that forty seven million manpower surplus will be seen in India by 2020, out of which only 10.6 million alone would be employable if the skill gap is not addressed, while the US will have a shortage of 17 million manpower in 2020. Hence, addressing this issue also is an opportunity for employment and societal benefit.

Work by (Agarwal 2012)[58], quantifies the employability issue of engineering graduates as 10.25% citing the World Bank report. He has explained a framework of combining various models and tools, like Deming's PDCA, 7QC tools, TQC (Total Quality Care), NBA (National Board of Accreditation) and other approaches and tools. His intent was to address Quality at the macro level of the Institution as a whole and not towards addressing the specific issue like an employability issue as attempted in this work.

Ramanan Lakshminarayanan (2014)[59], in their work, recognized the issue of employability of engineering graduates, analyzed the various skills that impact, system and various elements. They have proposed a framework by linking various elements and the focus is not to align with any of the successful quality models like TQM or Six Sigma embraced by industry with a demonstrated success.
Rajeev (2012) [60], very briefly touched upon the DMAIC model with a more focus on analytics. The focus is not to make a deep dive into the issue by leveraging six sigma model.

Ramasubramanian (2012)[61], has nicely captured the various roles of Six Sigma, explained DMAIC as one of the most familiar models of Six Sigma and broadly listed various tools applicable in various phases of Six Sigma to educational institutions at a macro level. The focus is not to dwell into the application of six sigma to the specific issue under discussions.

Vidya. al (2013)[62], have discussed the application of operational tools from Lean, Six Sigma, etc. on higher education and not on approach to resolving an issue.

Sean (2014)[63], has explained the Six Sigma models, tools, phases and various roles but, not delivered a framework. As brought out in articles (Rajeev 2012)[60] and (FICCI 2010) [64], under the globalization of Industrial scenario, there is a huge opportunity for the skilled workforce in employment, hence addressing the employability issues at all levels is helpful to the individuals, institutions and society at large. Hence, this work focuses on the specific topic of employability related to Engineering graduates which are most important to all stakeholders, particularly the students and employers in the context of employment.

2.8 RELATED STUDIES OUTLINES

Following are the outlines gathered from the related studies:

1. Regularly changing workplace demands.
2. Soft Skills should be fine tuned in engineering students.
3. Institutions should change their syllabus by including employability skills as one of the subject to be taught.
4. Students should have an interaction with Industry people at the end of every semester.
5. Arranging Internship, Mentorship, Counselling the juniors should be increased from 2\textsuperscript{nd} year of their study.
2.9 RESEARCH GAPS IDENTIFIED

On review of the existing literature, it is noted that many studies conducted on the reasons for poor employability and its consequences among the engineering graduates in the respective sample area.

The studies noted that the system, learning abilities, academic learning process and skill development programs, skill gap identification and filling methods, etc., but, no study is comprehensive in nature, including the role of personal demographics, parental demographics, environmental, organizational, teaching-learning processes, evaluation and improvement practices as reasons for poor employability and to the suggestions to improve the various dimensions to fill the gap.

Hence, the present study is taken up to do a comprehensive analysis of the factors affecting employability of the engineering graduates among the higher education institutions in the Greater Hyderabad city.