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A STUDY ON COMPETENCY MAPPING OF ENGINEERINGSTUDENTS FOR EMPLOYABILITY

Dr. V.M. Anitha Rajathi*1, D. Rohit*2

*1Assistant Professor, Department Of Management Studies, Anna University, Trichy, India.

*2Student, Department Of Management Studies, Anna University, Trichy, India.

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ABSTRACT

Competency mapping is an essential tool for assessing the skills and knowledge of Engineering students and can be used to determine their Employability. This process involves identifying and assessing the core competencies required for specific professional roles and matching them to the student's skills and potential. This summary focuses on Engineering student capability mapping and emphasizes its importance in determining Employability. This paper describes various competency mapping methods and tools such as self-assessments, behavioral interviews, and competency tests. It also examines key skills required for Engineering jobs, including Technical skills, Problem-solving skills, Teamwork, Communication, and Adaptability. The abstract concludes by highlighting the benefits of competency mapping for Engineering students and employers.

I. INTRODUCTION

Competency mapping is the system of figuring out the talents required to carry out efficiently mainly task. Students competency mapping refers back to the identity and evaluation of the talents and talents that scholars want to own in an effort to achieve success withinside the paintings place. Today, employers are seeking out applicants who have now nolonger most effective the desired instructional background, however additionally the talents and talents required for the task. Competency mapping can assist the scholars to discover their real competency degree and recognize the sure talents and understanding that required for the specific task. School exceeded out college students aren't aware of the employability talents. Educational establishments want to play a critical position to enhance the functionality of the scholars for the higher overall performance in a task position. The competency mapping system entails numerous steps. The first step is to discover the talents required in a selected area. These talents encompass their core area of understanding, critical thinking, problem-solving, communication, interpersonal talents, and different associated developments together with leadership, creativity, and adaptability. The talents are measured by self-evaluation and self-assessment and overall performance assessment. Employability skills, also known as soft skills or transferable skills, are a set of personal qualities, habits, attitudes and social skills that are valued by employers in the workplace. These skills are essential to succeed in the workplace, building a career, and adapting to the demands of the changing job market.

However, for Engineering students, there is a much wider undertaking on how they can conceptualize their knowledge and skills as well as aptitude in order to get a job. As the modern world is taking on a more dynamic constructional structure of inventing digital technologies, it is inevitable to realize that the supply of engineering job positions and the demand for Engineering students will continue with gradual rise in the future but the main problem faced by the Engineering students is the expected skills of an employer and the actual skills of the graduates which has been leaving a very big gap. Therefore this research article is going to address some ideas that can enhance the employability rate of engineering students in order to reduce and eventually eradicate the skills gap.

Statement of the Problem:

Students are facing significant challenges in identifying their right competencies for Employability. Many job seekers and students are not fully aware of the importance of Employability skills and access to reliable resources and tools. So there is a need for widespread awareness and accessible platforms that provides guidance, training and resources for the students to increase their employability skills for their career.

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Objectives of the study:

1. To study the actual competency level of engineering students.
2. To examine the level of skills expected by the company from engineering students.
3. To study and analyze the importance of various employability skills of engineeringstudents.

Needs of the study:

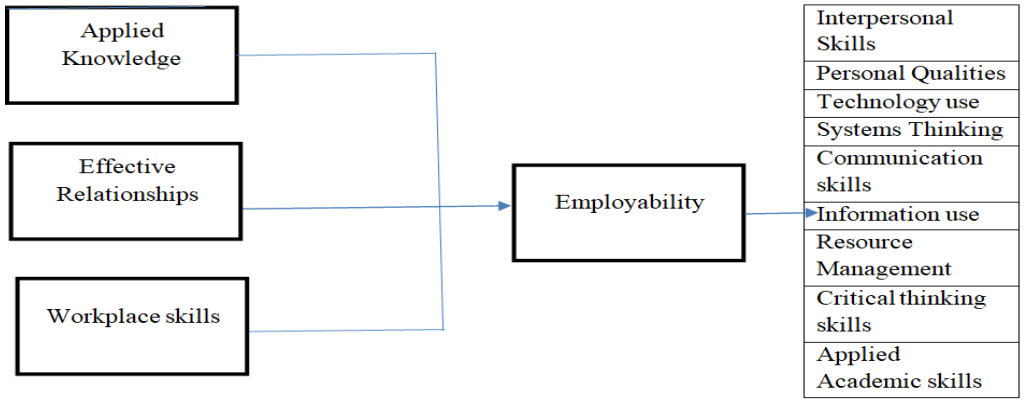
1. To study and analyze the competencies of engineering students to increase theemployability skills.
2. To help the students to go in a right path in their career direction.

Scope of the study:

1. To give a clear vision to the students on how they can improve their competency level before getting an employment.

2. The study also help the students to enhance the different skills and ability and then to find the required training needs.

Framework of this study:



II. REVIEW OF LITERATURE

P Madhavi Lakshmi and Dr. Tulasi Das As the nature of work has changed, so has the level of education and skills required. Competency-based learning contributes to an individual's academic knowledge, problem-solving ability, and overall employability. Provides sufficient technical knowledge and skills necessary to prepare for the profession.Skills and competencies lead to higher employability. The aim of this study was to analyze the factors that construct her mapping of competencies between graduates and employability. The study identifies employability skills based on industry exposure such as internships and industry visits.

Sudagoni Tejashwini and T. Sundeep This study explains why the employees need competencies and how to measure employee competencies. Competency mapping is the process of identifying an organization. Today, high-skilled and knowledge-based jobs are on the rise, while low-skilled jobs are on the decline. The main purpose of this study was to examine the effectiveness of competency mapping and employee satisfaction with training programs. New hires should be familiar with training methods such as coaching. It's very convenient for them. It helps you take on new challenges and use new skills to improve their performance.

Chithra. R The survey addresses employee and employer perceptions of the employability requirements for engineering students to join multinational companies. The survey showed a difference in perceptions between students and employees. Highly technical and challenging jobs require candidates who are likely to increase productivity and organizational value. The main purpose of this paper is to identify skill gaps for engineering graduates entering the software industry. This study examines whether all graduates should feel confident about the employable skills needed in the global market. Equipping employees with the right skills and knowledge through training enables them to work effectively.

Mr. Siddhant Jaiswal The study explores that organizations should shift their focus to competition. Long-term organizations need to rely more on talented people than on other resources. Competencies are one of the tools use to motivate employees, manage systems,and guide the company toward achieving common goals. This research requires identifying candidates with the right skills and abilities through an automated system. The

system is used to conduct automated tests and also helps organizations select the best candidates for the job.

Amudhayee NL and Divya PH This study aimed to identify progress in teachers' competence, as teachers are competitor builders. A teacher's competence level should be determined by competitive examinations. This competency model was developed to measure teacher competency levels in terms of skills, submitted work, published articles, and self-study. The matching process can be done through performance evaluations, training and development, and job descriptions. The primary aim of this study is to identify the relationship between aptitude and performance. This study analyzes different domains of competence and the relationship between competencies and the development of teacher performance.

Dr. VK Jain and Bhavya Ghandhi Competency mapping is the process of analyzing an employee's actual competencies in order to develop them to meet organizational goals. Employee competencies must be continuously developed. The three types of skills are the skills required to perform tasks, the skills required to complete challenges, and the skills required to complete other requirements. The primary objective of this study is to identify milestones, protocols and SOPs that map employee competencies. This model helps provide input for hiring and staffing. Companies need to evolve their competency models with changes of various natures

Dr. Saikumari, Ms. Sunitha, Kirthika SV, Jayakrishna AR and Lokeshwaran K Employees are the greatest asset of any organization. Businesses need to train their employees to be profitable. This training is aimed at improving the performance of newly hired employees. The research suggests companies need to implement more new methods and provide hands-on training to their employees. It helps you achieve business outcomes and analyze gaps between employee skills and future needs. This gives employees a clear path to contribute to the organization. This study proves that education and training play an important role in improving employee performance.

Aishwarya N This study is about mapping the competence of engineering faculties. Mapping Competencies in Engineering is rare and must be carried out by only some universities. Teacher competence mapping should develop both teachers and students. Educational institutions should offer development programs to improve the competence of teachers. Educational institution need to improve the quality of education and realize the vision and mission. Engineering institutions need to rethink their training methods and improve the quality of teaching for make skilled engineers

Divya Sharma Competency mapping is one of the key elements in identifying the skills needed to get the job done. This research focuses on identifying and analyzing the impact of skills on worker performance in the workplace. The main purpose of this study is to identify the skills and competencies that employees need and to provide an overview of the skills required in the IT industry. This survey helps employees clarify concepts and identify the different types of skills required for IT staff.

Urvashi Kaushal Specialized course programs such as Engineering strive to place the maximum number of students through campus interviews. Communication skills have been added to all engineering courses with the aim of improving performance in internships. A list of important employability skills from an engineering student's perspective. The authors conclude that a combination of employability skills and an engineering degree will ensure students meet the high expectations of their workforce.

III. RESEARCH METHODOLOGY

A research design is one that minimize bias and maximize the reliability of the data. It also yields maximum information, gives minimum experimental error, and provides different aspects of single problem. A research design depends on the purpose and nature of the research problem. Thus, one single design cannot be used to solve all types of research problem i.e. a particular design is suitable for a particular problem.

Descriptive Study:

The descriptive analysis is used for this research design. The descriptive study is one in which information is collected without changing the environment.

Questionnaire design: The structured questionnaire and closed ended questions are used to collect the data

Survey design: The data collected by using Google forms and field survey method.

Sample Size: sample size taken for the main study is 116.

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Sampling technique: Convenience sampling and sample size formula is used in this study.

Methods of Data Collection: The data was collected from primary data.**Statistical Tools used:**

The statistical tool was applied upon the data collected. Appropriate tools were used to analyse and make meaningful decisions. The hypothesis is framed and tested with the help of the suitable tool such as simple percentage, chi-square analysis and Correlation.

IV. DATA ANALYSIS AND INTERPRETATION

4.1 PERCENTAGE ANALYSIS

Table No: 4.1.1: Gender of the Respondents

S.no	Factors	No. of. Respondents	Percentage
1.	Male	70	60.3
2.	Female	46	39.7
	Total	**116**	**100**

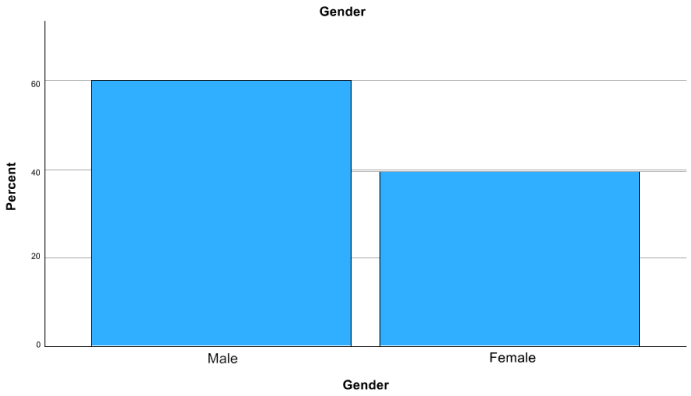

Figure : 4.1.1

Interpretation: From the above table shows 60.3% of the respondents are male and 39.7% ofthe respondents are female

Inference: The majority 60% of the respondents are male

Table No: 4.1.2: Age of the Respondents

S.no	Factors	No. of. Respondents	Percentage
1.	20	29	25.0
2.	21	66	56.9
3.	22	16	13.8
4.	23	5	4.3
	Total	**116**	**100**

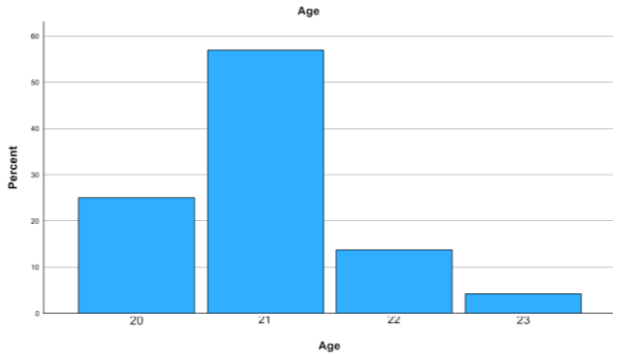

Figure No: 4.1.2

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Interpretation: From the above table shows 60% of the respondents are 21 age group and 25% of the respondents are 20 age group, 14% of the respondents are 22 age group and 4% ofthe respondents are 23 age group.

Inference: The majority 60% of the respondents are 21 age group

Table No: 4.1.3: Rate the proficiency in choosing engineering specialization

S.no	Factors	No. of. Respondents	Percentage
1.	Very good	18	15.5
2.	Good	55	47.4
3.	Acceptable	32	27.6
4.	Poor	8	6.9
5.	Very poor	3	2.6
	Total	116	100.0

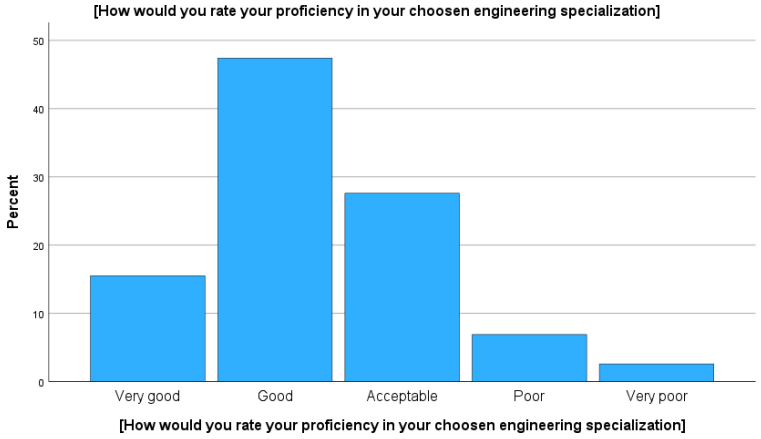

Figure No: 4.1.3

Interpretation: From the above table shows that 47.4% of the respondents are good and 27.6% of the respondents are acceptable and 15.5% of the respondents are very good, 6.9%of the respondents are poor and 2.6% of the respondents are very poor

Inference: The majority 47% of the respondents are good to rate the proficiency in choosing engineering specialization

Table No: 4.1.4: Level of applied knowledge in mathematics

S.no	Factors	No. of. Respondents	Percentage
1.	Very good	20	17.2
2.	Good	34	29.3
3.	Acceptable	50	43.1
4.	Poor	12	10.3
5.	Very poor	0	0
	Total	116	100.0

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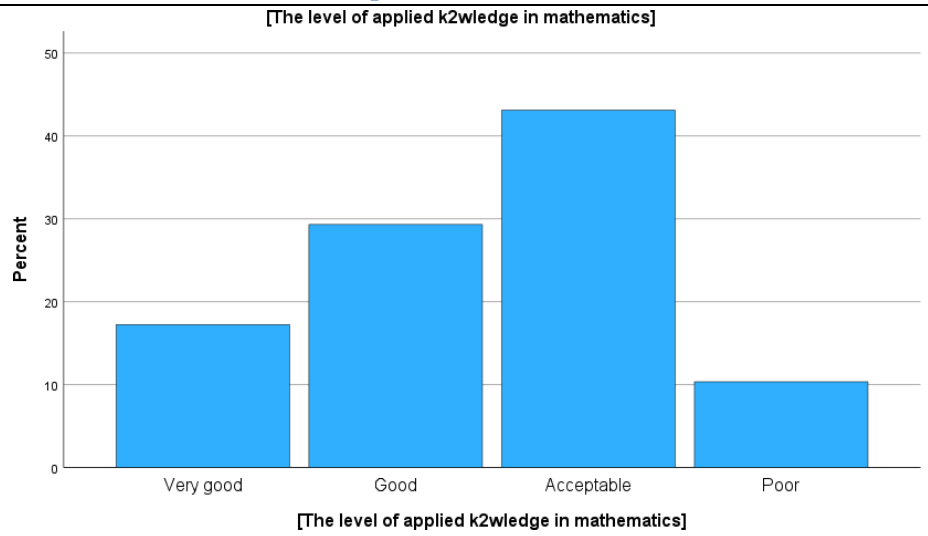

Figure No: 4.1.4

Interpretation: From the above table shows that 43.1% of the respondents are acceptable and 29.3% of the respondents are good, 17.2% of the respondents are very good, 10.3% of the respondents are poor

Inference: The majority 43% of the respondents are having the level of applied knowledge in mathematics

Table No: 4.1.5: The level of effective listening skill

S.no	Factors	No. of. Respondents	Percentage
1.	Very good	37	31.9
2.	Good	51	44.0
3.	Acceptable	24	20.7
4.	Poor	3	2.6
5.	Very poor	1	.9
	Total	116	100.0

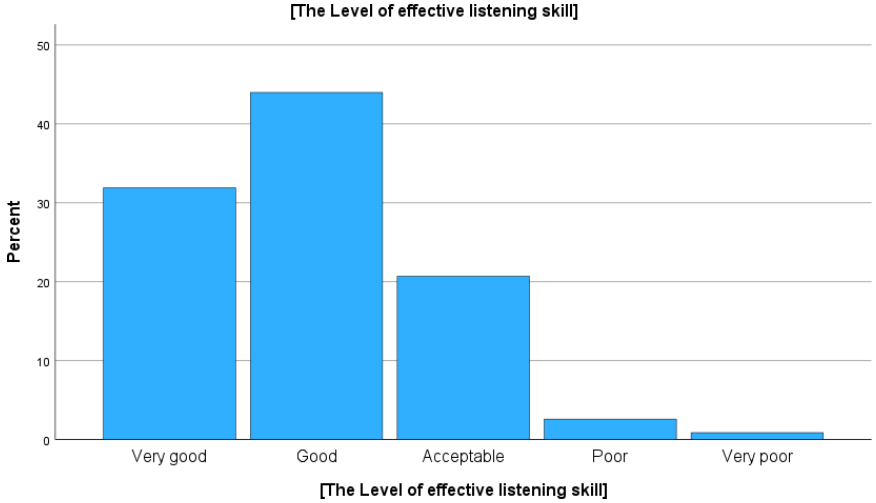

Figure No: 4.1.5

Interpretation: From the above table shows that 44% of the respondents are good and 31.9% of the respondents are very good, 20.7% of the respondents are acceptable, 2.6% of the respondents are poor 0.9% of the respondents are very poor

Inference: The majority 44% of the respondents are good in effective listening skill

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Table No: 4.1.6: The level of self-motivation

S.no	Factors	No. of. Respondents	Percentage
1.	Very good	53	45.7
2.	Good	35	30.2
3.	Acceptable	26	22.4
4.	Poor	2	1.7
5.	Very poor	0	0
	Total	116	100.0

Figure No: 4.1.6

Interpretation: From the above table shows that 45.7% of the respondents are Very good, 30.2% of the respondents are good, and 22.4% of the respondents are acceptable, 1.7% of therespondents are poor

Inference: The majority 46% of the respondents are good in level of Self-Motivation

CHI-SQUARE TEST

Hypothesis Test 1

Null hypothesis (H0): There is no significant difference between Gender and Proficiency

Alternative hypothesis (H1): There is a significant difference between Gender andProficiency.

Gender- How would you rate your proficiency in your choosen engineering specialization

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	6.255[a]	4	.181
Likelihood Ratio	7.260	4	.123
Linear-by-Linear Association	.540	1	.463
N of Valid Cases	116		
a. 4 cells (40.0%) have expected count less than 5. The minimum expected count is1.19.			

INTERPRETATION:

From the above table**,** The P value (0.181) is Greater than alpha value (0.05).

Therefore, null hypothesis is accepted.

INFERENCE:

There is no significant difference between Gender and Proficiency

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Hypothesis Test 2

Null hypothesis (H0): There is no significant difference between Gender – The level of applied knowledge in mathematics

Alternative hypothesis (H1): There is a significant difference between Gender – The level of applied knowledge in mathematics

Gender – The level of applied knowledge in mathematics

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	1.800[a]	3	.615
Likelihood Ratio	1.810	3	.613
Linear-by-Linear Association	.938	1	.333
N of Valid Cases	116		
a. 1 cells (12.5%) have expected count less than 5. The minimum expected countis 4.76.			

INTERPRETATION:

The P value (0.615) is Greater than alpha value (0.05). Therefore, null hypothesis is accepted. This shows that there is no significant difference between Gender – The level of applied knowledge in mathematics

INFERENCE:

There is no significant difference between Gender – The level of applied knowledgein mathematics

Hypothesis Test 3

Null hypothesis (H0): There is no significant difference between Gender and self-motivation

Alternative hypothesis (H1): There is a significant difference between Gender and self-motivation

Gender – The level of self-motivation

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	7.855[a]	3	.049
Likelihood Ratio	8.833	3	.032
Linear-by-Linear Association	.417	1	.519
N of Valid Cases	116		
a. 2 cells (25.0%) have expected count less than 5. The minimum expected count is .79.			

INTERPRETATION:

From the above table, The P value (0.049) is less than alpha value (0.05).

Therefore, null hypothesis is rejected.

INFERENCE:

There is a significant difference between Gender and self-motivation

Hypothesis Test 4

Null hypothesis (H0): There is no significant difference between Gender and Effectivelistening skill

Alternative hypothesis (H1): There is a significant difference between Gender and Effective listening skill

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Gender – The level of effective listening skill

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	106.864[a]	48	<.001
Likelihood Ratio	41.460	48	.736
N of Valid Cases	122		
73 cells (93.6%) have expected count less than 5. The minimum expected count is .41.			

INTERPRETATION:

From the above table, The P value (<.001) is less than alpha value (0.05).

Therefore, null hypothesis is rejected.

INFERENCE:

There is a significant difference between Gender and Effective listening skill

CORRELATION

Correlation Test 1

NULL HYPOTHESIS (H0): There is no relationship between Interest in mathematicalAbility and Applied mathematical Knowledge

ALTERNATIVE HYPOTHESIS (H1): There is relationship between Interest in mathematical Ability and Applied mathematical Knowledge

The level of interest in mathematical Ability - The level of applied knowledge inmathematics

		[The level of interestin mathematical Ability]	[The level of applied knowledge in mathematics]
[The level of interest in mathematicalAbility]	Pearson Correlation	1	.651**
	Sig. (2-tailed)		<.001
	N	116	116
[The level of applied knowledge inmathematics]	Pearson Correlation	.651**	1
	Sig. (2-tailed)	<.001	
	N	116	116

**. Correlation is significant at the 0.01 level (2-tailed).Correlation value: 0.651

Positively correlatedHence H1 accepted.

INTERPRETATION: Since we get positive linear relation, so there is relationship between Interest in mathematical Ability and Applied mathematical knowledge.

Correlation Test 2

NULL HYPOTHESIS (H0): There is no relationship between communication skills and Written and oral communication (mediation, negotiation, intervention)

ALTERNATIVE HYPOTHESIS (H1): There is relationship between communication skills and Written and oral communication (mediation, negotiation, intervention)

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How would you rate your communication skills - The Level of written and oral communication (mediation, negotiation, intervention)

		[How would yourate your Communication skills]	[The Level of written and oral communication (mediation, negotiation, intervention)]
[How would yourate your Communication skills]	Pearson Correlation	1	.498**
	Sig. (2-tailed)		<.001
	N	116	116
[The Level ofwritten and oral communication (mediation, negotiation, intervention)]	Pearson Correlation	.498**	1
	Sig. (2-tailed)	<.001	
	N	116	116

**. Correlation is significant at the 0.01 level (2-tailed).Correlation value: 0.498

Positively correlatedHence H1 accepted.

INTERPRETATION: Since we get positive linear relation, so there is relationship between communication skills and Written and oral communication (mediation, negotiation, intervention)

V. FINDINGS FROM THE STUDY

Findings from percentage analysis

1. The majority 60% of the respondents are male
2. The majority 60% of the respondents are 21 age group.
3. The majority 47% of the respondents are good at proficiency in choosing engineeringspecialization
4. The majority 43% of the respondents are having the level of applied knowledge inmathematics
5. The majority 44% of the respondents are good in effective listening skill
6. The majority 46% of the respondents are good in level of Self-Motivation

Findings from chi square test

1. The P value (0.181) is Greater than alpha value (0.05). Therefore, null hypothesis is accepted. This shows that there is no significant difference between Gender - how would you rate your proficiency in your choosen engineering specialization

2. The P value (0.615) is Greater than alpha value (0.05). Therefore, null hypothesis is accepted. This shows that there is no significant difference between Gender – The level of applied knowledge in mathematics

3. The P value (0.049) is less than alpha value (0.05). Therefore, null hypothesis is rejected. This shows that there is a significant difference between Gender – the level of self-motivation

4. The P value (<.001) is less than alpha value (0.05). Therefore, null hypothesis is rejected. This shows that there is a significant difference between Gender – the level of effective listening skill

Findings from correlation analysis

1. Correlation value (0.651)get positive linear relation, so there is relationship between The level of interest in mathematical Ability - The level of applied knowledge in mathematics

2. Correlation value (0.498) get positive linear relation, so there is relationship between How would you rate your communication skills - The Level of written and oral communication (mediation, negotiation, intervention

VI. SUGGESTIONS

1. Institution should encourage and provide support for all students to improve their self- motivation. This could involve providing mentorship, career counselling, or resources to help students develop effective study habits and time-management skills.
2. Offer training and support for all students to develop their listening skills, which are critical for effective communication in any field, including engineering. This could involve workshops or coaching from experienced professionals.
3. Encourage students to participate in engineering competitions, These competitions provide students with an opportunity to apply their mathematical and theoretical knowledge to real-world problems, work in teams, and showcase their skills to potential employers.
4. Provide training and support in developing soft skills such as interpersonal communication, public speaking, time management, and conflict resolution. These skills are crucial in the workplace.
5. Providing classroom instructions and encourage the students to participate in internships that focus on developing employability skills such as communication, teamwork, leadership, problem-solving, and critical thinking. These skills are essential for success in the workplace.

VII. CONCLUSION

After conducting a study on competency mapping of engineering students for employability, it can be concluded that there are several key competencies that are essential for the employability of engineering students. These competencies include technical skills, communication skills, problem-solving skills, teamwork, adaptability, and leadership. It is important for engineering students to develop and demonstrate these competencies through their academic coursework, internships, and other extracurricular activities. Employers are looking for candidates who possess these competencies and can apply them in real-world situations. The study also highlights the importance of bridging the gap between industry requirements and academic curriculum to enhance the employability of engineering graduates. This can be achieved by incorporating industry-specific projects, internships, and training programs into the academic curriculum. Overall, the study emphasizes the need for engineering students to develop a broad range of competencies to enhance their employability and succeed in the competitive job market.

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