

EQ for Engineers: Emotional Intelligence in Engineering

Kajal Yadav, Sefali Shah, Rachna Sharma

Abstract—Emotional intelligence or emotional quotient (EQ) is progressing area for research. EQ means intelligence of emotions, how smartly you work with your as well as other's emotions describes your emotional intelligence. It was traced in 1995 after which it started capturing its importance in various fields. This paper reviews the role of EQ in an engineer's life and reveals some real-life statistics of EQ obtained from the survey. We took a survey of 224 engineers to get the present scenario of EQ in our society and 24 managers from multinational companies to get the idea of what they are expecting from their fresher. An engineer must own skills like effective leadership, communication, teamwork, and relationship management. Overall this paper signifies the utility of EQ in an engineer's professional life. It aims at bringing awareness about EQ among the civilization.

Index Terms— *Emotional Intelligence; Emotional Quotient; Emotions; Interpersonal skills; Intrapersonal skills; survey.*

I. INTRODUCTION

Emotion can be defined as a state of feeling arising due to various thoughts, psychological changes, behavior or expression. In earlier days, reasoning skills and logical thinking were the only parameters to judge the intelligence of a person but then in 1998 gardener made a captivating question which was like, "If there were no IQ tests then how would the intelligence level measured?" This inspired many researchers to think one step ahead and that is how "Emotional intelligence (EQ) came into existence. Before 1995, Emotions were not considered in the study of intelligence. But after the advent of "Emotional Intelligence", it was taken into consideration. Human beings have the ability to express their feelings and thoughts resulting from their verbal or non-verbal behavior. Emotions have a substantial effect on individual's personal as well as professional life. Emotional Intelligence can be defined as the skill of understanding own feelings as well as recognizing other's feelings and guiding them in such a way that it leads to progress in personal and professional life. It is the skill to deal with emotions in a smart way. Emotional Intelligence is catching the vision of industries,

scientists, and the public. Emotional intelligence is the ability of a person to know, evaluate and control his emotions in a positive manner such that it brings to his success and happiness. Emotional Intelligence does not depend on gender, institutions but socio-economic status has its effect on Emotional Intelligence (EQ) [6]. Emotions are an integral part of the mankind, so EQ plays a vital role in one's personal life as well as the carrier. Intelligence is the representation of your emotions in a highly sensible way. You make your emotions work as per your control in order to lead a successful life. Intelligence quotient (IQ) term is known to all of us but very few persons are aware of the term "EQ". Emotional Quotient (EQ) is a union of interpersonal and intrapersonal skills whose adoption allows an individual to progress in his/her career. EQ focuses on both professional as well as personal progress. We know our well-known scientist Einstein, who is known for his numerous researches in physics. He had a very good level of IQ (160-190) but did not possess a good level of EQ. Due to IQ, he earned fame in this field of research but he could not keep up equally with personal life due to poor Emotional skills. Thus, he could not become successful on both the sides i.e., personal and professional. On the other hand, we know Mahatma Gandhi, freedom fighter whose ultimate goal was to make India independent from British rule. His family life and professional life both were good because he had a good level of EQ. though there were no EQ tests those days we know which skills he had. Some of those were Empathy, effective communication, self-awareness, and self-regulation. These skills reflected the level of his EQ and he led a successful life being good at EQ.

II. COMPONENTS OF EMOTIONAL INTELLIGENCE

The components of Emotional Intelligence are those basic qualities based on which EQ Level of a person is decided. The Emotional intelligence can be categorized into five major aspects. They are:

A. Self-Awareness

It can be defined as the ability to understand one's own strengths, weakness, threats, emotions, moods and their impacts on other people [7].

B. Self-Management

It involves managing or controlling one's own emotions. It will help to keep away all the bad feelings and adapting to the circumstances by moving in the desired direction with the team [7].

Manuscript received September 05, 2017; revised April 27, 2018; accepted July 25, 2018.

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C. Empathy

It involves an understanding of other's emotions. In other words, you are keeping your legs in other's shoe. Without Empathy, healthy personnel relations are difficult to sustain [7].

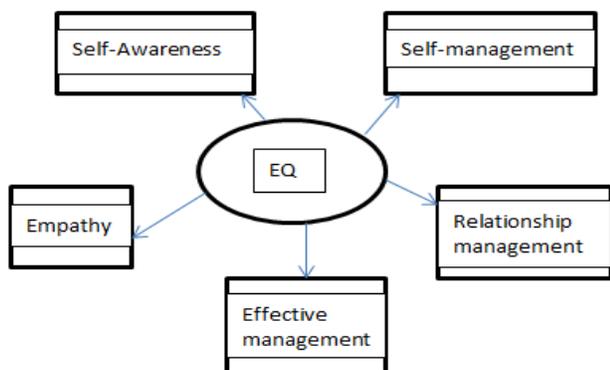


Fig. 1: Components of Emotional Intelligence

D. Relationship management

By building good relations with others, you can raise your EQ level but nowadays we are so busy doing our own work that we do not care about relationships. A good relationship among team members can help you to move in the direction of your goal [7].

E. Effective communication

Communication can help you to build relationships which will again lead to the increment of EQ level. An effective communication may be verbal or non-verbal will help to manage relationships [7].

III. EQ FOR ENGINEERS

In engineering profession, one can never think of handling a complete project alone. So there comes the importance of personnel relationships and teamwork. An engineer has to deal with many persons throughout his career. To work with other peoples he must have good communication power, understandability and convincing power which comes under "EQ". So for a successful career in engineering, one must have a good level of Emotional Intelligence (EQ). IQ is important for an engineer because it will help to acquire a job but to sustain one requires EQ. while ranking the engineers in the firm, EQ becomes the deciding factor. There IQ won't be tested anymore instead how fast he is able to collaborate with the team members, how effectively he is able to communicate, how he is able to handle the work with other team members etc. will be checked. An engineer must be a motivator for his workers. For being an admirable motivator he/she must have the knowledge of the weakness of the individual worker. An engineer who is able to judge the weakness and troubles of his workers in every situation and guide him the correct way is a true motivator. Here, again the importance of "Emotional intelligence" comes into limelight.

It is not necessary to always remain work oriented and professional. Many engineers have a lack of awareness about

this problem. They pay more attention to strict control of fulfillment of rules and regulations of the industry while forgetting the humanity. They act like a strict boss and creates a distance between them and their workers. In worst cases, workers are not able to communicate effectively and share their problems with the strict boss. This can even bring worst effect on the performance of the team. To avoid such issues an engineer must understand the necessity of showing empathic behavior toward labors. For being an empathic engineer, an individual must be able to understand the other's emotions, other's problems and possess the capability to solve their disputes, communicate, lead, motivate, develop mankind and catalyze change. An engineer needs a good level of EQ to own the above-mentioned skills. He must be a master in teaching what he desires to have in others. This is a very important skill of "emotionally intelligent" peoples which helps them to achieve the goals. For an example, a team can give its best only when its members are united. To build a united team, an engineer must know how to manage relationships and also he should be able to teach his team the same thing. Having good relationships with others will create unity among the members.

IV. ENGINEER AS A LEADER

An engineer must also possess good leadership skills. These good leadership skills must include two things. One is getting work done with high quality and quantity standards of performance and another is getting work done through others along with their satisfaction and adherence. In today's world, workers cannot deal with autocratic leadership due to the growing perception of freedom and democracy. Emotion can bring changes in the thinking process in many aspects. Those engineers who are leaders specifically require high emotional intelligence because they have to deal with customers and other peoples outside the organization and convince them to accept their work. According to my research along with the conceptual study shows that EQ is an indispensable part of leadership. Without it even if a person has a good intellect, practical knowledge, analytical mind and numerous ideas but still he would not make a good leader. An emotionally intelligent leader understands the needs of his subordinates and tries his best to return him a positive feedback.

"Emotional Intelligence" plays a crucial role in managing, directing and controlling one's emotions towards work and Efficiency at work. Awareness of one's emotions and adapting one's self according to the requirement of Industry requires emotional proficiency and emotional sensitivity. The outcome of an employee strongly depends upon the group, opinions, and proposals of others.

V. EMPIRICAL STUDY

We conducted a survey on "EQ for Engineers". We took a survey of about 20 questions from 224 engineers. We had 85.7% of participants from E.C, 5.8% from I.C, 4.01% from Mechanical, 1.7% from Electrical, and 1.7% from CS/IT department of Engineering. We got 21.4% response from 4th year engineering students, 16.51% from 3rd year students, 15.62% from 2nd year students, 12.05% were graduated and remaining were from 1st year of Engineering.

Apart from that we have also conducted a survey of managers from resources, energy and logistics Indian conglomerate. They were asked regarding their expectations from fresher engineers. It supported us in a way that we got clear idea about impact of EQ in present industries. Total 14 managers participated in this survey.

This survey was conducted online wherein all participants were asked to fill up the form, containing questions related to Emotional Intelligence. Their response were represented graphically where data is shown on the basis of individual options chosen by how many participants. Based on obtained data, current condition of EQ was brought into light. However some questions were skipped by individuals as per their convenience but it didn't affect our research and we have shown our result accurately based on the number of participants.

VI. MATERIALS AND PROCEDURE

We have generated a questionnaire related to the day-to-day factors contributing to EQ. We have specifically focused on an engineer's life because being an engineer we know how these few EQ skills plays vital role in sustaining professional life peacefully. This question bank was prepared by conducting a brainstorming session with the second author. It took about 1 month to collect the data. We took responses in the graphical form for some important questions. The rating is done from 1 to 5 and each option specifies the following:

- 1- Strongly disagree
- 2- Disagree
- 3- Sometimes
- 4- Agree
- 5- Strongly agree

Their answers (ratings) are based on their personal opinions, therefore by taking average of responses we can conclude about present conditions of EQ in the society and its importance in any engineer's life.

For managerial survey, a separate question bank was prepared to become aware about importance of EQ in the Industries. This was about engineers, now we'll show you some data from the survey carried out from industries focusing on what do they expect from the present and what are the practical concerns of EQ in present industries. The specifications of rating are as follows:

- 1- poor
- 2- less than average
- 3- average
- 4- good
- 5- excellent

VII. DATA ANALYSIS AND RESULTS

Here, X-axis shows the options and Y-axis shows the percentage rating level for individual option.

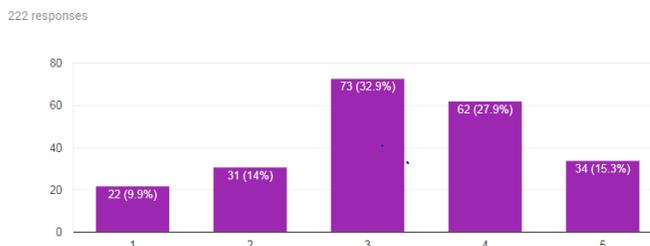


Fig. 1: Rating describing their reactions

When they were asked whether they act impulsively when frustrated or not, we got the response given in Fig. 1. An engineer with high EQ would calmly deal with any situation. Acting impulsively never becomes a part of their behavior. From these results, it is found that only 53 engineers (Those who opted for option 1 and 2) out of 222 were disagree with the point that they act impulsively.

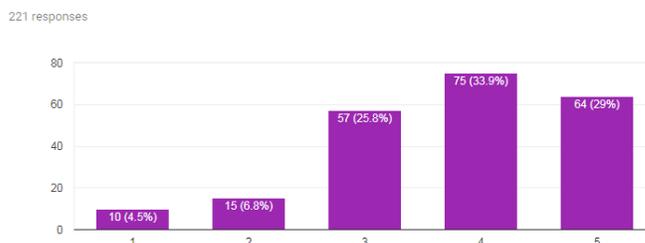


Fig. 2: Rating describing their Empathy

Fig. 2 shows the rating of the engineers when they were asked whether they are aware of other's moods or not. An engineer with high EQ is always aware of other's moods. We got positive feedback as about 139 engineers accepted that they are aware of other's moods.

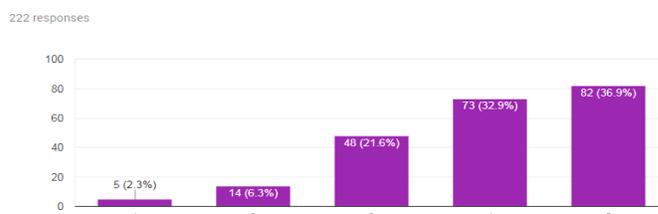


Fig. 3: Rating describing their self-awareness and courage

Fig. 3 shows the rating of the engineers about their self-awareness. They were asked whether they were honest in presenting themselves in front of others. An Engineer with High EQ would always attempt to present himself/herself with the best of his knowledge. Here also we got positive feedback as 155 engineers have mastered this skill.

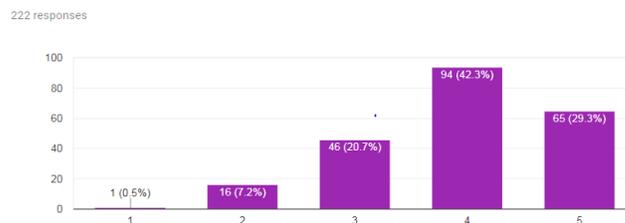


Fig. 4: Rating describing their flexibility

Fig. 4 shows the rating of the engineers when they were asked about their flexibility in any situation. If an engineer is able to manage self and others according to the situation he is dealing with then he is said to be emotionally intelligent. This skill is also having positive feedback, as 159 engineers were flexible according to the result of survey.

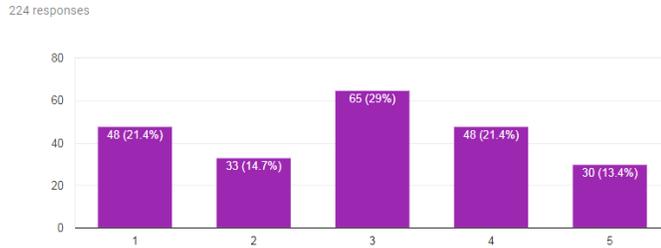


Fig. 5: Rating describing their communication skills

Fig. 5 shows the rating of the engineers when they were asked whether they feel nervousness while communicating with the crowd or not. About 65 engineers are still uncertain about it.

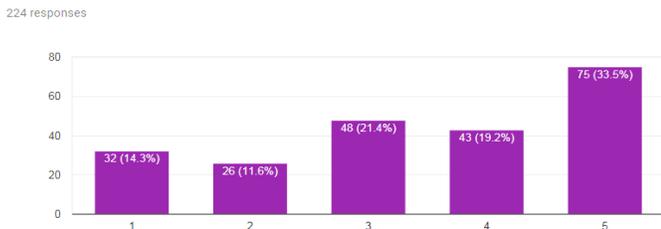


Fig. 6: Rating describing their relationship management

Fig. 6 shows the rating of the engineers when they were asked whether they believe in team work or working alone. Majority of engineers believe in team work as seen in the graph (118 engineers) but still the ratio of those believing in working alone is also considerably high. Emotionally Intelligent person gets well along with others; hence team work is not that difficult for him/her.

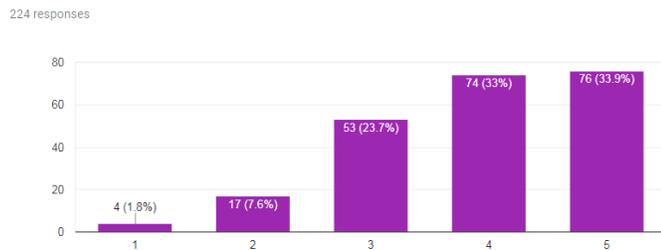


Fig. 7: Rating describing their self-motivating skills

Fig. 7 shows the rating of the engineers when they were asked whether they would encourage themselves while passing through a frustrating situation. Almost all the engineers have this skill as seen in Fig. 7.

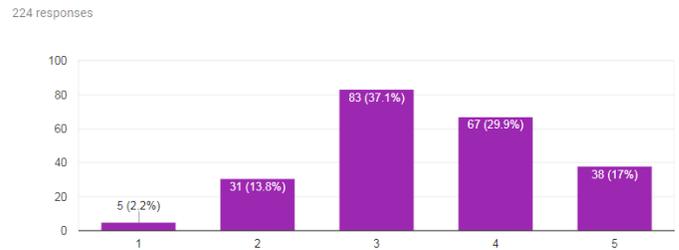


Fig. 8: Rating describing their confidence

Fig. 8 shows the rating of the engineers when they were asked about their confidence level during failure. Emotionally Intelligent engineer would never allow negative feelings to dominate over them. When passing through a failure stage they would remain the same confident persons as they are. According to result, majority of engineers are uncertain about it.

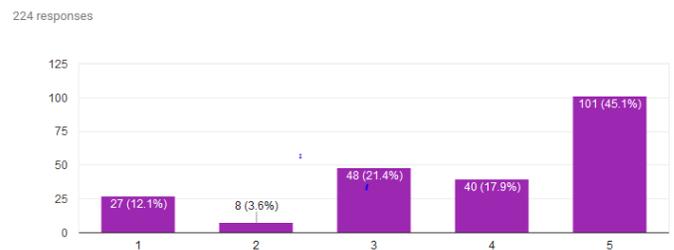


Fig. 9: Rating describing their intension

Fig. 9 shows the rating of the engineers when they were asked whether they would focus more on end result or knowledge. The one having high EQ would balance of these because the workplace is not just a platform to learn new things but it is to show your abilities. So an engineer with high EQ will focus on gaining knowledge as well as end result both. From these, which one gets the high priority it depends upon the situation. Majority of 101 engineers gave priority to knowledge.

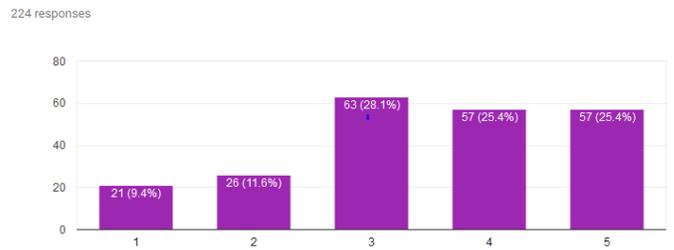


Fig [10]: Rating describing their personal decisions

Fig. 10 shows the rating of the engineers when they were asked whether they would make decisions related to personal life, emotionally or practically. Here, personal life decision meaning marriage or similar things. An engineer having high EQ would rather take decisions based on emotions and practical perspectives than focusing on any single consequence. He will balance both the scenarios equally.

This was all about survey from engineers and now next is about managers and their expectations from their fresher.

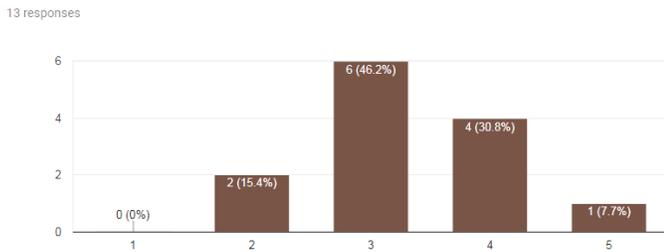


Fig. 11: Rating describing communication skills of engineers

Fig. 11 shows the rating of the managers when they were asked about the communication skills of their fresher. This result shows that they have average communication skills, as per most of the managers.

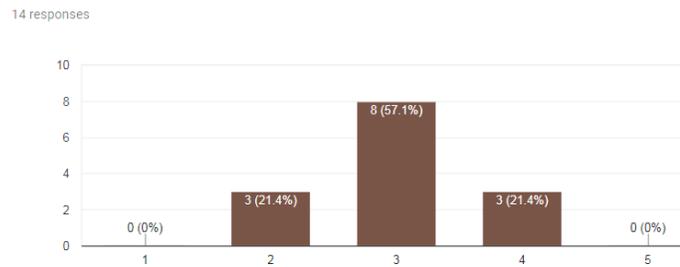


Fig. 12: Rating describing level of EQ in fresher

Fig. 12 shows the rating of the managers when they were asked about the level of EQ found in the newcomers. Most of them told average EQ. This result reflects that we have to work more on Emotional intelligence skill.

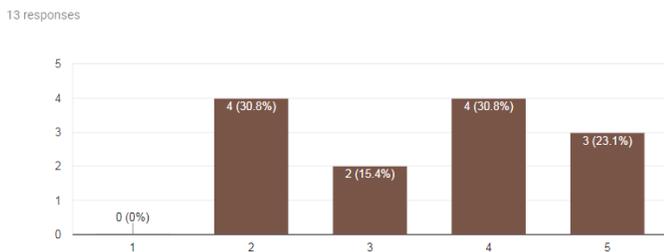


Fig. 13: Rating describing adaptability

Fig. 13 shows the rating of the managers when they were asked about the speed of engineers in adapting the changes in work environment. There were mix opinions but majority were telling it average. It needs to be improved.

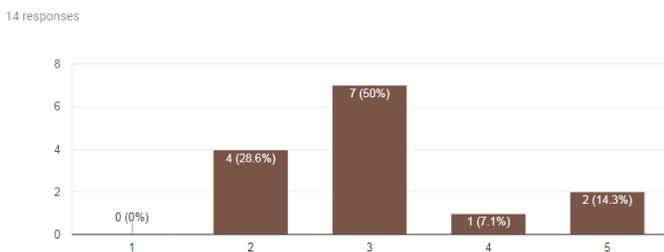


Fig. 14: Rating describing level of talent in engineers

Fig. 14 shows the rating of the managers when they were asked about the talents of their engineers. This talent involves both technical as well as non-technical skills. Our result clearly shows that 50% of managers told average.

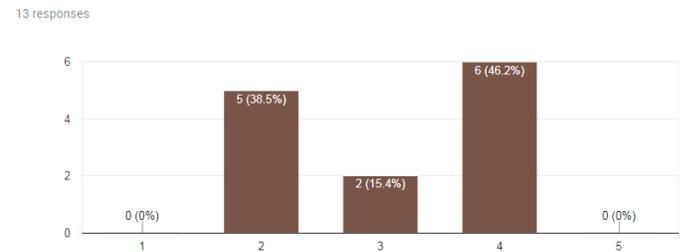


Fig. 15: Rating describing the skills of teamwork and handling

Fig. 15 shows the rating of the managers when they were asked about the abilities of engineers in handling critical situations and collaborating with the team. We got positive response from 46.2% managers which was majority.

VIII. CONCLUSION

By going through the pieces of literature and our survey, we can conclude that for an engineer to succeed in his career he needs to have a good EQ along with a moderate level of IQ. If the engineer is good at recognizing his own as well as other's feelings he can easily communicate and motivate his co-workers. This skill will always help him to achieve success in his field. From our survey, we could point out two main skills in which an engineer needs to have a hands on is communication skills, confidence while instructing a crowd and motivational skills. From our second survey of managers, we got to know that EQ is more important than IQ and engineers are having good skills but still needs to go deeper in EQ.

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