

# The Combined Influence of EQ & IQ Towards Building Positive Attitudes among Engineering Students: A Structural Equation Modelling Approach

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## Abstract

*In recent years, the emotional quotient and intelligence quotient have been considered an important factor in understanding and forecasting an individual's accomplishment and have become a significant influence on managerial practices. Students with higher emotional quotient and intelligence quotients are expected to achieve higher levels in both their academic and personal lives. Most of the studies examined the impact of emotional quotient and intelligence quotient on academic performance discretely, and their combined influence was not studied. Thus, this study analyzes the influence of emotional and intelligence quotient on building confidence and positive attitudes among students. Data was gathered from 355 engineering students from various engineering colleges covering the cities of Hyderabad and Telangana. The collected data has been analyzed through the convenience random sampling technique. Further, structural equation modeling has been employed to test the generated hypotheses. The result indicated that the emotional quotient and intelligence quotient significantly influence the confidence and positive attitudes of engineering students. The significant levels of influence of EQ and IQ on positive attitudes and confidence in career development are 0.575\*\*\* and 0.488\*\*. The findings provide significant inference to students in terms of developing emotional and intellectual values that are required to be inculcated in them to possess a good academic record and career achievement.*

**Keywords:** Emotional quotient, Intelligence quotient, Engineering students, positive attitudes, Student career.

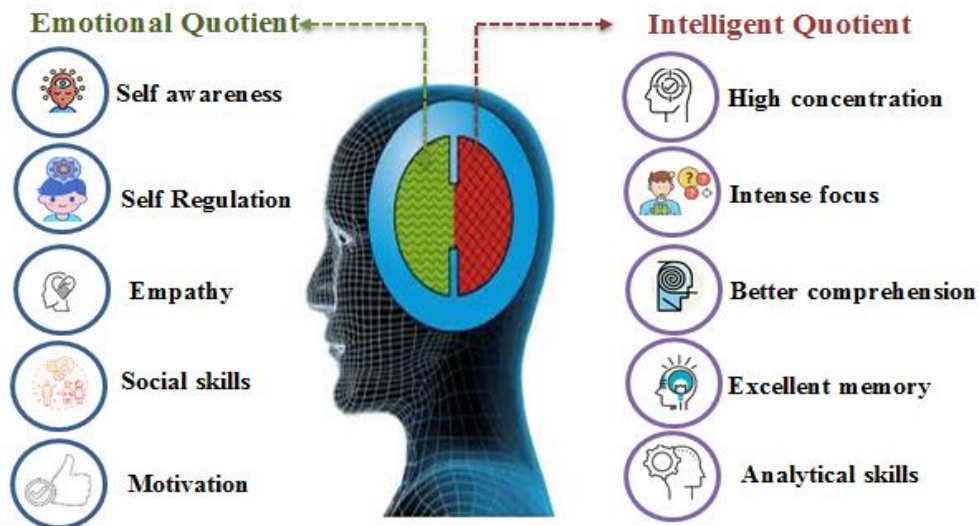
## 1. Introduction

In the past decades, the world has become more and more complex due to higher requirements for people's cognition, and science and technology have progressed faster and faster. Thus, adapting to the experience of traditional simple society and thinking is becoming less and less adaptable to modern society and it has become complex for college students. During the school period and after graduation, there was a great difference in academic performance. After 10 or 20 years, some students have outstanding academic performance while some students have average academic performance. Thus, intelligence is the rational ability of an individual to respond to stimuli in a purposeful way [1,2], which includes

abstract thinking, learning, and problem-solving capabilities (He & Wang, 2021; Stalin & Prasad, 2014). Frequently, the transition phase from higher education to work life does not follow a clear and well-defined path, often resulting in it being a challenging and problematic time for students as they often feel ill-prepared for the challenges and reality of employment (Jameson et al., 2016). To be successful in interpersonal [3], building positive attitudes, and career domain, Emotional Quotient (EQ), and Intelligent Quotient (IQ) becomes important factors that have a profound effect on students' attitudes and performance (Asrar-ul-Haq et al., 2017). The IQ is the phenomenon that involves

assessment regarding one's capability to observe analyze and interpret the circumstances. It's the intellectual aptitude of an individual that is measurable and can be denoted numerically (Gondal & Husain, 2013; Shetty C, 2012). The essential skills that reflect IQ are, Vocabulary practical life skills, Visualize and memorize skills, Listening and memorizing skills, Create-forming and innovative with model and without model. The intelligence level tests are utilized to gauge the capacity to tackle issues and understand ideas. This incorporates different capacities associated with IQ to see the connections

among items. Thus, this intelligence has been associated with the results of outstanding corporate leaders [4], successful entrepreneurs, and successful individuals (Babu et al., 2019; Nachiappan et al., 2014). Thus, the present research study aimed to analyze the EQ and IQ among engineering students in building confidence and positive attitudes in their careers. The objective of this study is to identify the factors affecting the EQ and IQ levels of the students and explore the level of confidence and positive attitudes of students. The diagrammatic representation of EQ and IQ is shown in Figure 1.



**Figure 1** Diagrammatic representation of EQ and IQ

**2. Related Works**

(Mendoza & Hontiveros, 2017) intended to justify EQ, which directly leads to career success [5-7]. Further, it explored the relationship between intrinsic career success and independent variables. The study sample has been collected from 117 graduate students of the University of Santo Tomas. By using a Pearson Correlation coefficient, the collected data has been analyzed. Thus, this study showed that the EQ and independent variables had a positive and significant relation with intrinsic career success i.e. ( $r=.42$ ;  $p<.00$ ). Next, the emotional quotient was a statistically significant predictor  $B=.37$ ;  $p<.00$  in the regression results. The sample size was limited in this study. (Kaya et al., 2017) investigated the critical thinking disposition of nursing students and their EQ in an

academic year. Data has been gathered during the academic year of 2012 to 2013 from 197 nursing students. The collected data has been analyzed by using a cluster sampling method. The result of this study indicated that there was a statistically significant difference between their EQ and critical thinking disposition. At the beginning and end of academic years, there was a positive correlation and medium level between EQ and students [8]' critical thinking disposition. However, this study was based on longitudinal research, thus, it required a long time for both skills. (Villa Gonzalo, 2013) explored the relationship between the EQ, IQ, adversity quotient (AQ), spiritual quotient (SQ), and the academic performance of students. Sample of a data has been gathered from the 100 participants from St. Alexius

College during the year 2015-2016 in the city of Koronadal, South Cotabato. By using a stratified sampling technique, the collected data has been analyzed. The result indicated that there was a positive and significant correlation between the IQ and the academic performance of the students. Further, it had a highly significant relationship between EQ and academic performance. The collected sample was limited in this study and the result might be generalizable to other universities. (Wahyuningsih & Suryadi, 2018) examined the effect of EQ, IQ, and spiritual intelligence on the ethical attitudes of University students. Primary data has been collected from 120 respondents from two Islamic universities in Pekanbaru. The collected data has been analyzed by using a Purposive sampling technique. Next, the hypotheses were generated and tested by using multiple linear regression analysis. Thus, this study concluded that EQ, IQ, and spiritual intelligence had a significant effect on the ethical attitudes of university accounting students. The data has been collected in a particular region; the result might differ in other regions or universities. (Saibani et al., 2015) intended to examine the EQ achievement among undergraduate students of Engineering. A sample of a study has been gathered from the 491 respondents who have registered for an EQ level test in the University Kebangsaan in Malaysia from the four consecutive years of 2010 to 2014 from year 1, year 2, year 3, and year 4. By using a Malaysian EQ Inventory (MEQI) test, the EQ scores had been measured. The result showed that the empathy, maturity, self-awareness, and social skills of these domains achieved the highest increment. Further, self-motivation [9], self-regulation, and spirituality showed a slight decrease. (Anupama, 2021) analyzed the emotional intelligence and entrepreneurial attitude orientation among students. Data has been gathered from 87 business program students in the United Arab Emirates (UAE). For the analysis of the result, a two-stage randomized sampling method has been employed. The result concluded that emotional intelligence like self-esteem and self-perception had a negative relation with the variables of entrepreneurial attitude orientation. Furthermore, the

attitudinal orientation had a significant impact on identifying and promoting students as entrepreneurs.

### 3. Research Methodology

This present research study is conducted to analyze the influence of emotional quotient and intelligence quotient among engineering students in building confidence and positive attitudes in their careers. A convenience random sampling technique has been employed in this study based on well-structured questionnaire research. A sample of a study has been collected from engineering college students in Hyderabad and Telangana. A total of 400 questionnaires were distributed among engineering college students in the academic year 2018 to 2022. The questionnaire was prepared by the 5-point Likert scale. The 5-point Likert scale ranging from “Strongly agree”, “Agree”, “neutral”, “disagree”, and “Strongly disagree” was used for the analysis. Primary and secondary data were collected. Primary data has been collected through a questionnaire. The secondary data has been taken from journals, magazines, books, newspapers, articles, websites of stock market government publications, etc. A total of 400 participants were targeted for filling out questionnaires however 355 participants fully responded to support the study and filled out every aspect of the questionnaire. The remaining 45 respondents did not properly reply to the structured questionnaires. Further [10], to find out the frequency distribution of respondents’ responses from the research questionnaire and describe in depth, the variables are studied by using descriptive statistical analysis. To analyze the interpretation of the data, simple statistical tools like percentage analysis, and mean and standard deviation were used. The questionnaire was intricately designed to tap the demographic variables including age, gender, EQ, and IQ level of the respondents. The demographic characteristics and analysis of the respondents are shown in below Tables 1a, b, c, d, and e. The details of the respondents given about their age, gender, year level, emotional quotient, and intelligence quotient are shown in Table 2.

**Table 1 [a-e] : Demographic characteristics of the respondents (N=355)**

(a)

Age	Frequency	Percentage (%)
16 to 18	83	23.38%
18 to 20	167	47.04%
Above 20	105	29.57%

(b)

Gender	Frequency	Percentage (%)
Male	193	54.36%
Female	162	45.63%

(c)

Year Level	Frequency	Percentage (%)
1 <sup>st</sup> year	49	13.80%
2 <sup>nd</sup> year	67	18.87%
3 <sup>rd</sup> year	116	32.67%
4 <sup>th</sup> year	123	34.64%

(d)

Emotional quotient	Frequency	Percentage (%)
100 to 120	28	7.88%
120 to 140	123	34.64%
140 to 160	181	50.98%
160 to 170	13	3.66%

(e)

Intelligence quotient	Frequency	Interpretation
71 to Below	9	Boarder line
72 to 79	34	Low
80 to 87	117	Below average
88 to 111	175	Average
112 to 119	15	Superior
120 to 127	5	Very Superior

**Table 2 : Analysis of self-confidence and positive attitudes in career**

Statement	Mean	Standard deviation
S1- My contribution is as important as anyone else's	4.16	2.01
S2- Keep trying to learn, even if I am nervous	3.98	1.75
S3- I believe in myself	4.11	1.93
S4- Enjoy being an engineer when I graduate	4.24	2.18
S5- Ask for help from the teacher when needed	3.71	0.92
S6- Pay attention to the lecturer during lessons	3.86	1.23
S7- Willing to put more effort into my future career	3.77	0.83
S8- Follow my path	4.01	2.13

**Table 3 (a): Analysis of influencing factors of emotional quotient**

Emotional quotient	Mean	Standard deviation (SD)
Self-awareness	37.41	2.54
Self-confidence	39.05	4.01
Empathy	35.72	2.93
Self-control	34.17	2.98
Self-motivation	33.15	3.11

**Table 3 (b): Domain score of emotional intelligence**

Variable	Mean	SD	Standard error mean	t-value	Sig.(2- tailed)
Emotional quotient	104.19	13.90	1.576	2.404	0.02*

\* p value <0.05

The above table 3(a) represents the influencing factors of emotional quotient (Anupama, 2021; Shetty C, 2012). The influencing factors of the emotional quotient are self-awareness and self-confidence; Empathy, self-control [11], and self-motivation were taken for analyses by calculating mean and standard deviation values. Here, the influencing factors of self-confidence achieved the highest mean value, which is 39.05 and its standard deviation is 4.01 followed by the other influencing factors of Self-awareness (M= 37.41, SD= 2.54), Empathy (M= 35.72, SD= 2.93), Self-control (M= 34.17, SD= 2.98), and Self-motivation (M= 33.15, SD= 3.11). In Table 3 (b), the domain score of the emotional quotient has been calculated. From the table, the result indicated that the emotional quotient achieved the total mean and standard deviation of 104.19 and 13.90 respectively. Thus [12], it obtained a standard error mean value of 1.576, and its t-value and significant value are 2.404 and 0.02\*

respectively.

#### 4. Result And Discussion

In this section, the data from the collected samples were analyzed and discussed. Here, the hypotheses were generated and tested by using structural equation modeling. The reliability and validity analysis of the construct were measured. The correlation coefficients between the emotional quotient and the intelligent quotient were analyzed And discussed in this section. The following hypotheses are framed and tested to find results.

- **H1:** EQ has a positive influence in building students' confidence and positive attitudes in career
- **H2:** IQ has a positive influence in building students' confidence and positive attitudes in career

**Table 4 (a): Estimation of the measurement model**

Constructs	Number of items	Mean	SD	AVE	Composite reliability
EQ	5	13.09	5.23	0.906	0.95
IQ	6	11.67	4.92	0.893	0.89

**Table 4 (b): Path coefficient analysis**

Structural model		
Structural path	Standardized coefficients (β)	Level of significance (p value)
EQ->PA	0.575	**
IQ->PA	0.488	**

p≤0.01 (\*\*=moderately significant)

The above tables 4 (a) and 4 (b) represent the estimation of the measurement model and path coefficient analysis (Khan, 2019). In the estimation of the measurement model, the construct of emotional quotient and intelligent quotient was taken for analysis. The mean, standard deviation, average variance extracted (AVE), and composite reliability were calculated for the constructs. The values of

reliability exceed a threshold of 0.70 and range from 0.89 to 0.95. Next, the AVE estimates the quantity of variance captured by a set of items in a scale relative to the measurement error. The acceptance of these values ranges from 0.893 to 0.906 for engineering students. The mean and standard deviation of the emotional quotient is M= 13.09, SD= 5.23 and the intelligence quotient is M= 11.67, SD= 4.92.

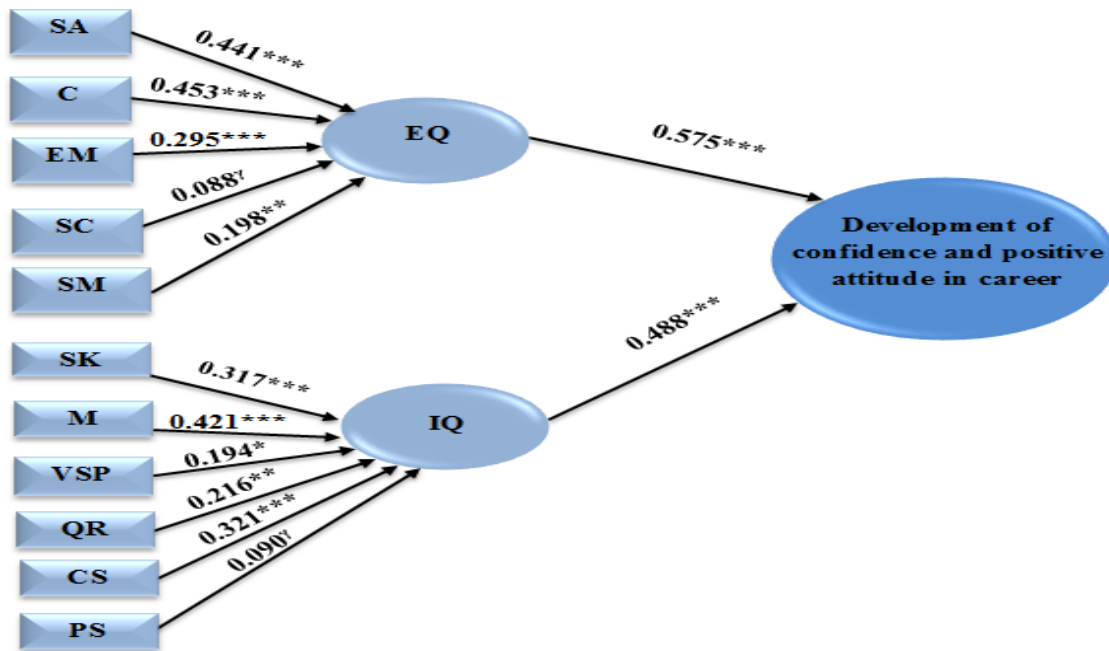
**Table 5: Analysis of correlation coefficients of EQ and IQ constructs**

EQ constructs	EQ	p-value
Self-awareness (SA)	0.441	***
Confidence (C)	0.453	***
Empathy (E)	0.295	***
Self-control (SC)	0.088	γ
Self-motivation (SM)	0.198	**
IQ constructs	IQ	p-value
Specific skills (SK)	0.317	***
Memory (M)	0.421	***
Visual-spatial processing (VSP)	0.194	*
Quantitative reasoning (QR)	0.216	**
Communication skills (CS)	0.321	***
Perceptual skills (PS)	0.090	γ

**$P \leq 0.001$  (\*\*\*) = highly significant),  $p \leq 0.001$  (\*\*) = moderately significant),  $p \leq 0.05$  (\*) = low significant, and  $p > 0.05$  (γ = not significant)**

The regression analysis of the model of emotional quotient and intelligent quotient was taken for the analysis. The unstandardized coefficients and standardized coefficients, t-value, and significant values were measured (Wahyuningsih & Suryadi, 2018). In above Table 5 unstandardized coefficients, the emotional quotient achieved the highest standard error, which is .036 and the standard error of the intelligence quotient is .025. In the standardized coefficients, the beta values of the emotional quotient and intelligent quotient are .075 and .177,

respectively. Furthermore [13], in the regression analysis, the intelligent quotient obtained the highest t-value and significant value, which are 2.294 and .032, respectively and the emotional quotient values are .817 and .023, respectively. In the unstandardized coefficients, the constant model obtained a standard error in unstandardized coefficients, which is 3.244 and its t-value and significant values are 5.216 and .000, respectively. The structural equation model on the constructs of emotional quotient and intelligence quotient is shown in Figure 2.



**Figure 2** Structural equation model on the constructs of emotional quotient and intelligence quotient

### Conclusion

This present study was conducted to analyze the influence of EQ and IQ among engineering students in building positive attitudes and confidence. Further, this study identified the factors affecting the EQ and IQ levels of the students and explored the level of confidence and positive attitudes of students. Data has been taken from 355 engineering students in Hyderabad and Telangana. In this study, a convenience sampling technique was used for the data collection. Then, the SEM model was used for the hypotheses analysis [14] of the result. This study concluded that the variables of EQ and IQ contribute significantly to students' behavior. Then, the regression analysis test indicated that the EQ and IQ on confidence and positive attitudes were found to be positive and statistically significant i.e. 0.575\*\*\* and 0.488\*\*, respectively. Therefore, the findings in this study provide significant inference to students in terms of developing emotional and intellectual values that are required to be inculcated in them to possess a good academic record and career achievement. However, the study only focused on engineering students, covering the cities of Hyderabad and Telangana. In the future, the study can be extended

by considering more populations and various regions.

Further, it also investigated the various influencing factors of EQ and IQ in career development. Then, the level of EQ and IQ of the university students in each class level should be studied. Further, in the future, this study should also compare the relationship between EQ and IQ with other additional aspects. Further, replicating the same study in any other major students [15] and employees should also consider other dependent variables like employee performance and employee satisfaction. In the future, this research study can also be conducted by understanding any indirect effect of IQ and EQ in conjunction with other factors and variables.

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