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Research Article

Relationship Between Grit and Emotional Intelligence Among Engineering Students

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ABSTRACT

This research investigates relationship between emotional intelligence (EI) and grit among undergraduate engineering students in Gurgaon district. The objectives were to determine the levels of emotional intelligence and grit, as well as to assess the significant relationship between these two variables. Utilizing a quantitative approach and a descriptive survey method, the study sampled 140 students. Data was collected using stratified random sampling technique. Grit was assessed using the 12-item, 5-point Likert-style Grit Scale Survey (Duckworth et al., 2007), which measures consistency of interests and perseverance of effort. the Emotional Intelligence Scale developed by Anukool Hyde, Sanjyoth, and Upinder Dhar (2002), while Statistical analyses, including mean, SD and Pearson product-moment correlation, were employed. The study uncovered a very weak positive correlation between grit and emotional intelligence among engineering students in Gurugram.

Key Words: Grit, Emotional Intelligence, Resilience, Engineering Education

I.INTRODUCTION

Grit has gained significant attention as a non-cognitive factor influencing success across diverse fields. Defined as "perseverance and passion for long-term goals" (Duckworth et al., 2007), grit encompasses two primary facets: perseverance of effort and consistency of interest. These qualities enable individuals to sustain commitment toward goals despite setbacks or obstacles, making grit a critical factor in achieving long-term success. The personality traits associated with grit include self-regulation, self-discipline, resilience, conscientiousness, dutifulness, and low impulsivity (Buzzetto-Hollywood, 2017; Eskreis-Winkler et al., 2014). For instance, self-regulation involves guiding behavior to achieve goals, while resilience pertains to recovering from challenges. Emotional Intelligence (EI), which involves the ability to identify, understand, and manage one's own emotions as well as those of others, has emerged as an important predictor of various life outcomes, including academic success. Daniel Goleman popularized the concept of Emotional Intelligence, highlighting the crucial role of emotional competencies in achieving personal and professional success. These competencies include self- awareness, self-regulation, motivation, empathy, and social skills. While traditional indicators of academic success, such as Intelligence Quotient (IQ) and standardized test scores, primarily assess cognitive abilities, EI encompasses skills that enhance interpersonal relationships, stress management, and overall well-being, all of which can influence academic performance. In the context of engineering education, the role of non-cognitive factors such as grit and EI is vital. EI, characterized by self- awareness, empathy, and self-regulation, complements grit in helping students navigate the demanding academic environment. Engineering students often face a rigorous curriculum that demands sustained effort, adaptability, and effective time management. Traits such as perseverance and emotional regulation play a pivotal role in coping with academic pressure and achieving consistent performance. Furthermore, the ability to collaborate in team projects and communicate effectively, aspects linked to EI, significantly contributes to the holistic development of engineering professional while previous studies have examined grit and EI independently, limited research has explored their interplay, particularly in the context of undergraduate engineering education. By investigating the relationship between these grit and emotional intelligence, this study aims to identify strategies to enhance students' ability to manage teaching methods, and student support services, fostering a more balanced approach to education that values both cognitive and non-cognitive factors.

II. LITERATURE REVIEW

Research underscores the importance of grit in predicting success across various domains. Duckworth et al. (2007) found that grit surpasses IQ as a predictor of academic achievement and career success. Studies show that grittier individuals achieve higher grades, persist in demanding environments like West Point Military Academy, and demonstrate superior performance in challenging contexts such as the National Spelling Bee (Duckworth et al., 2007; Duckworth & Quinn, 2009). The relationship between emotional intelligence (EI) and grit has been widely studied, with research emphasizing their interdependence in predicting perseverance and long-term success. In "The Relationship Between Grit and Emotional Intelligence in University Students" by Esin Özer, published in Psycho-Educational Research Reviews (2021), a study conducted among students at Konya Selçuk University revealed a significant positive correlation between grit and EI. Dimensions such as self-control and emotionality were found to be strong predictors of grit, showcasing the importance of emotional regulation in sustaining perseverance over time. Similarly, Ain et al., in Heliyon (2021), explored the roles of EI and grit in life satisfaction. Their research highlighted that emotional intelligence—through self-awareness and interpersonal skills—plays a foundational role in developing grit. The study also established that these traits significantly enhance individuals' ability to achieve long-term personal and professional goals, leading to increased life satisfaction. A meta-analysis titled "A Meta-Analysis of the Relationship Between Emotional Intelligence and Academic Performance in Secondary Education" by Nicolás Sánchez-Álvarez, María Pilar Berrios Martos, and Natalio Extremera, published in Frontiers in Psychology (2020), further underscores the connection between EI and grit. While focusing on academic performance, the analysis demonstrates that emotional intelligence facilitates resilience and perseverance, traits central to grit, particularly when dealing with academic challenges. "Emotional Intelligence and Grit as Predictors of Academic Resilience Among University Students" by George E. Perry and colleagues, published in Psychological Studies (2019). This study highlights the significant role of emotional intelligence in building grit, which in turn fosters academic resilience. By examining university students, the researchers found that higher emotional intelligence, particularly emotional regulation and empathy, contributed to greater persistence and adaptability when facing challenges. The study emphasizes how these traits collectively enhance students' ability to navigate setbacks and achieve their long-term academic goals. Study titled "Exploring the Interplay of Emotional Intelligence and Grit in Predicting Resilience" by Singh and Jha published in Journal of Positive Psychology, highlights the interplay between emotional intelligence and grit in fostering resilience. The authors argue that emotional intelligence, particularly the ability to manage emotions and adapt to stress, enhances grit, allowing individuals to persist through adversity and maintain focus on long-term goals

. This study, published in Psycho-Educational Research Reviews (April 2021) titled "The Relationship between Grit and Emotional Intelligence in University Students" by Esin Özer, examined 230 students at Konya Selçuk University. It concluded that there is a significant positive correlation between grit and emotional intelligence, with dimensions like self-control and emotionality being strong predictors of grit.

III.RESEARCH DESIGN

Research Objectives

This study focuses on the following objectives:

1.To explore the relationship between emotional intelligence and grit among undergraduate engineering students.

2. To identify actionable strategies to enhance EI and grit in engineering education.

Research Hypothesis:

H0: There is no significant relationship between emotional intelligence and grit in undergraduate engineering students.

Tools Used:

Grit was assessed using the 12-item, 5-point Likert-style Grit Scale Survey (Duckworth et al., 2007), which evaluates *consistency of interests* and *perseverance of effort*. The Emotional Intelligence Scale by Hyde, Sanjyoth, and Dhar (2002) was used to measure EI. This scale is developed and standardized by Anukool Hyde, Sanjyot Pethe and Upinder Dhar (2002). The 34 statements are rated on a five-point scale. The subjects were required to respond to each item in terms of "Strongly disagree, Disagree, Neutral, Agree, strongly agree." The test meant for knowing the difference between individuals. The 10 sub- scales are i.e. 1) Self-awareness, 2) Empathy, 3) Self- Motivation, 4) Emotional stability, 5)

Managing Relations, 6) Integrity, 7) Self- development, 8) Value orientation, 9) Commitment, 10) Altruistic Behaviour. This is well known test having high reliability (split-half reliability 0.88) and high validity (0.93). A total of 140 students of 3 different engineering colleges in Gurugram were taken as sample. To find out the relationship between emotional intelligence and grit of engineering college students Pearson`s product moment correlation statistical technique was used.

IV. FINDINGS OF THE STUDY

This study aimed to explore the relationship between grit and emotional intelligence of engineering college students in Gurugram district. In this research, emotional intelligence was considered as the dependent variable, while grit was viewed as the independent variable. The analysis was conducted based on specific objective which is as follows:

To find out the relation between the grit and emotional intelligence of engineering college students. In order to achieve this objective, Null hypothesis was formulated. To assess the significant relationship between grit and emotional intelligence among engineering college students., the researcher employed Pearson's correlation coefficient and calculated the r value.

Statistic	Grit	Emotional Intelligence Score
N	140	140
Mean	42.30	112.54
SD	6.45	11.45

Table (1): Mean and SD for Grit and Emotional Intelligence Score.

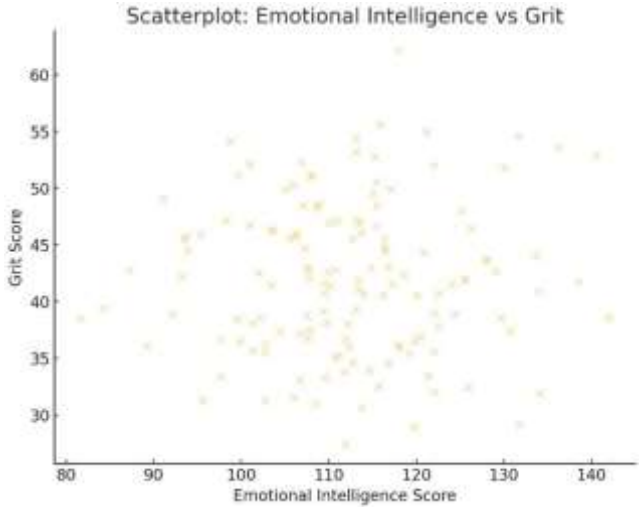
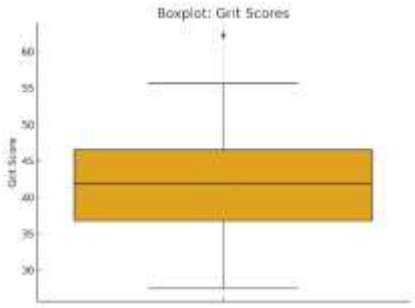


Fig (1): Scatterplot: Emotional Intelligence vs Grit

The scatterplot shows a scattered distribution of data points with no distinct pattern, confirming the weak correlation between emotional intelligence and grit.



Fig(2): The boxplot illustrates the spread of grit scores

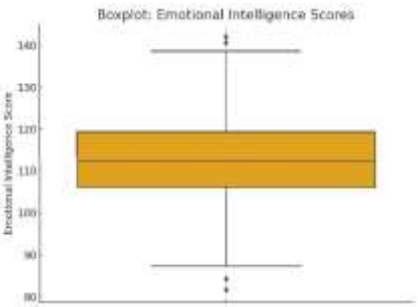


Fig (3): The boxplot illustrates the spread of Emotinal Intelligence scores

N	Variables	Coefficient of Correlation	Level of significance
140	Emotional Intelligence and Grit	0.003	Significant at 0.05 level

Table (2): Coefficient of Correlation for Grit and Emotional Intelligence Score.

The Table 1 reveals that coefficient of correlation (r) between grit and emotional intelligence engineering college students is 0.003 which is positive and significant at 0.05 level of significance. So, the hypothesis "There exists no significant relation between grit and emotional intelligence." is accepted. Thus, it can be interpreted that there is a very weak positive insignificant relationship between grit and emotional intelligence engineering college students. So, it cannot be definitely concluded that in case a student is having emotional intelligence, then that student will also possess grit. The results gave no indication that the level of grit increases with advancement in emotional intelligence or vice-versa.

Based on the findings of this study, several strategies can be proposed to enhance both emotional intelligence (EI) and grit in engineering education. One effective approach would be to integrate emotional intelligence training into the curriculum, with modules focused on self-awareness, emotional regulation, empathy, and social skills. This could help students better manage stress and academic challenges. Additionally, mentoring and counselling programs should be strengthened, offering students personalized support to develop resilience and emotional intelligence. These programs would guide students through academic and personal challenges, fostering both grit and emotional competence. Incorporating resilience training into the curriculum is another valuable strategy. Seminars and workshops focused on perseverance and coping strategies could help students overcome setbacks. Collaborative learning environments, which encourage teamwork and communication, can also promote EI and grit, as students work together to solve problems and resolve conflicts. Moreover, introducing mindfulness and stress management programs would aid students in managing emotions and reducing stress, improving their emotional regulation. Finally, promoting a growth mindset in students would encourage them to embrace challenges and view setbacks as opportunities for growth, which is essential for developing both emotional intelligence and grit. These strategies collectively aim to prepare students to handle the demands of their academic and professional futures.

V. CONCLUSION

The Pearson correlation coefficient between **Grit Score** and **Emotional Intelligence Score** is:

• **r = 0.03**, which indicates a **very weak positive correlation** between grit and emotional intelligence in this dataset.

This suggests that there is almost no linear relationship between the two variables, as evidenced by the low correlation coefficient.

For the present research problem, there exists certain limitation. This study has several limitations that should be considered when interpreting the findings. First, the sample size consisted of 140 students from three engineering colleges in Gurugram, which may not be fully representative of the broader engineering student population across different regions or institutions. This limits the generalizability of the results. Second, the cross-sectional nature of the study restricts the ability to establish causal relationships between emotional intelligence and grit, as the data was collected at a single point in time. A longitudinal study could offer more insights into how these variables evolve. Additionally, self- report questionnaires were used to measure both grit and emotional intelligence, which are susceptible to biases such as social desirability or inaccurate self-assessment, thus affecting the validity of the findings.

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