iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 14 **Issue:** II **Month of publication:** February 2026

DOI: https://doi.org/10.22214/ijraset.2026.77240

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 14 Issue II Feb 2026- Available at www.ijraset.com

Comparative Study of Self-Esteem and Automatic Thoughts between Male and Female Undergraduate Engineering Students

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Abstract: ***This study explores the comparison of self-esteem and automatic thoughts of male and female undergraduate engineering students. The sample size consisted of 110 young adults (55 males and 55 females), who were aged between 18-25 years. The sample was purposively selected from Engineering students by administering the Self-Esteem Rating Scale and the Automatic Thoughts Questionnaire on them. The data was further analysed with the help of SPSS version 27. The findings revealed significant gender differences in self-esteem, with male and female students displaying distinct levels of self-worth. Similarly, automatic thoughts varied significantly across genders, indicating that the automatic cognition differ between male and female undergraduate engineering students. Additionally, the study identified a significant negative relationship between self-esteem and automatic thoughts. This suggests that students experiencing higher levels of automatic thoughts tend to report lower self-esteem, highlighting the detrimental impact of maladaptive cognition on psychological well-being. Overall, the study emphasizes the need for gender-sensitive interventions that promote psychological resilience and well-being among undergraduate engineering students.***

Keywords: Self-Esteem, Automatic Thoughts, Gender Differences, Engineering Students, Psychological Well-Being.

I. INTRODUCTION

The human kind has prospered due to the presence of thoughts. From time immemorial it has been observed that thoughts constitute the concept of behavior. Since psychology focuses on behavior, the predecessor medium is gaining equal importance as both causal factor as well as the facilitator. Therefore, thoughts portray the beauty of brain and how biologically 19.7 billion cells incorporate in developing the medium for an action. The present paper focuses on the self-esteem and automatic thoughts of male and female undergraduate engineering students using the comparative research design. This chapter includes how self-esteem and automatic thoughts have evolved as a concept over time.

A. Self-Esteem

William James (1892) pioneered the concept of 'self' and 'self-esteem' in his book, *Psychology: The briefer course (9th edition).* He explained the multiple dimensions of 'self' with the help of two components of the self, that is, "I" (the subjective self) and "Me" (the objective self). He defined the concept of self-esteem as the ratio of success to pretensions. Upon which, Cooley (1902) argued that self-esteem develops through social interactions rather than existing solely within a person introducing the concept of the "looking-glass self," suggesting that people form their self-image based on how they think others perceive them. Building upon Cooley's idea, George H. Mead (1934) further explained that the self is developed through interacting with other people, in his book *Mind, Self and Society*. Additionally, Rogers (1951) explained that self-esteem is closely tied to how people see and understand themselves. He believed that individuals develop a healthy sense of self-worth when they feel accepted and valued for who they are, and called it unconditional positive regard, which helps people feel secure, confident, and true to themselves. Further, Abraham Maslow discussed self-esteem in detail in his book *Motivation and Personality* (1954), which expanded upon his earlier work *A Theory of Human Motivation* (1943). Within Maslow's hierarchy of needs, self-esteem occupies the fourth level, following physiological, safety, and love/belonging needs. He conceptualized esteem needs as the desire for a stable and positive self-evaluation, distinguishing between internal esteem and external esteem. Also, he believed that healthy self-esteem is correlated to self-actualization.

Moreover, among the various tools developed to assess self-esteem, the Rosenberg Self-Esteem Scale (RSES) introduced by Rosenberg (1965) in his book *Society and the Adolescent Self-Image*, is the most widely used and validated measure comprising of 10-items, designed to measure global self-esteem. Later, Susan Harter developed the Self-Perception Profile for Children (SPPC) consisting of a total of 36 items that measures a school-age child's sense of general self-worth and self-competence in the domain of academic skills (Harter, 1982, 1985). While, Mark R. Leary (1999) proposed the Sociometer Theory, which views self-esteem as an internal signal reflecting how accepted and valued a person feels by others in the society, Cast and Burke (2002) introduced the identity theory which says that self-esteem develops through self-verification within groups, where people look for confirmation of their roles and identities. Similarly, Bailey (2003), in his article on the foundation of self-esteem, argued that self-esteem is a complex, vaguely defined concept that is often studied from the above-ground structure. Therefore, his work was concentrated solely on the foundational level of self-esteem. Further, Park and Crocker (2005) examined the interpersonal consequences of seeking self-esteem and found out that ego threat affects interpersonal behavior differently depending on the self-esteem and contingent self-worth of a person.

Later, Judge and Bono (2001) investigated the relationship among the four core self-evaluation traits such as, self-esteem, generalized self-efficacy, locus of control, and emotional stability with respect to job satisfaction and job performance and observed that all the four traits were positively associated with job satisfaction as well as job performance. On the other hand, Neff and Vonk (2009) compared self-compassion and global self-esteem as two different ways people relate to themselves. Then, Osborne (2024) explained in his article how self-esteem develops through the interaction of self-concept, feedback from experiences, and attributional processes by discussing how individuals interpret successes and failures and how these attributions shape and perpetuate positive or negative self-esteem cycles.

B. Automatic Thoughts

Albert Ellis (1957) introduced Rational Therapy (RT) in his seminal article *Rational Psychotherapy and Individual Psychology*, later renamed Rational Emotive Therapy (RET) in 1961, and eventually Rational Emotive Behavior Therapy (REBT) in 1993, and proposed that no psychological consequences are directly caused by activating life events but are a result of irrational beliefs. The theory was based on the ABC model. Ellis's book *Reason and Emotion in Psychotherapy* (1962) was instrumental in legitimizing the cognitive paradigm in clinical settings. Parallel to Ellis's work, in his book *Cognitive Therapy of Depression*, Aaron T. Beck (1970), while developing Cognitive Therapy, observed that depressed individuals frequently experience spontaneous, involuntary negative cognitions concerning the self, the world, and the future, which he conceptualized as the cognitive triad (Beck, 1967). He labelled these cognitions as 'automatic thoughts' and later integrated cognitive and behavioral components into the well-known therapy called, the Cognitive-Behavioral Therapy (CBT) and introduced cognitive restructuring, in which individuals are guided to recognize, examine, and change the distorted automatic thoughts, helping them develop greater awareness of their thinking processes and adopt healthier patterns of thought. (Beck, 1970).

While talking about giving meaning to the automatic thoughts, Beck and Clark (1997) introduced a three-stage schema-based information processing model of anxiety highlighting the significant role of automatic thoughts and their interpretations in the onset of anxiety. Later, Beck, Emery, and Greenberg (1985) in the book *Anxiety Disorders and Phobias: A Cognitive Perspective*, emphasized on the information-processing biases and explained maladaptive cognitive schemas, biased threat appraisals, and automatic thoughts related to danger and vulnerability as the causal factors of anxiety and related disorders. Complementing the existing ATQ framework, Ingram and Wisnicki (1988) developed a 30-item self-report scale to assess the frequency of positive automatic cognitions.

Burns (1980) wrote a book *Feeling Good: The New Mood Therapy*, in which he came up with the concept of cognitive distortion, that is, the irrational thought patterns that may lead to negative emotions like anxiety and depression. Likewise, Judith Beck (2011) authored *Cognitive Therapy: Basics and Beyond*, dedicating the book to her father, Aaron T. Beck, in which she systematized and expanded upon the cognitive model originally proposed by him. Going back to how Beck earlier suggested that negative cognitive schemas about the self, world, and future can lead to automatic negative thoughts, LeMoult and Gotlib (2002) further explained that understanding these automatic thoughts is central to cognitive approaches in depression. Also, Smith and Lazarus (1990) proposed that emotions are shaped by cognitive appraisals, by putting forward a two-stage appraisal process, emphasizing the role of personal evaluation in determining emotional responses and adaptation. Furthermore, Clarks and Wells (1995), developed the Cognitive Model of Social Phobia and Teasdale and Barnard (1993), in their book *Affect, Cognition and Change: Re-Modelling Depressive Though*, focused on the negative cognitive biases and maladaptive thought patterns associated with depressed mood and proposed the Interacting Cognitive Subsystems (ICS) model.

According to this model, automatic thoughts influence emotions indirectly through these schematic processes. Further, Rachman and Shafran (1999) introduced the concept of Thought-Action Fusion (TAF), a cognitive distortion with two forms, that is, probability TAF and morality TAF. According to them, it is the TAF that contributes to anxiety and obsessive-compulsive symptoms by increasing the emotional impact of intrusive thoughts.

II. RATIONALE

The field of engineering mainly emphasizes on the technical skills and academic performances; most students are unable to comprehend their own feelings and emotions as well as behaviors through the lens of psychological factors. The persisting pressure to succeed academically, accompanied with strong family and societal expectations, has a negative impact on their mental well-being. Also, recent reports of student suicides in prestigious engineering institutions such as the IITs indicate that students' difficulties extend beyond academic pressure and often involve emotional distress, negative automatic thoughts, and feelings of inadequacy that remain unnoticed or unsupported. When students are unable to recognize or make sense of their inner experiences, these difficulties can intensify, increasing vulnerability to stress and hopelessness. Therefore, this study aims to explore self-esteem and automatic thoughts among undergraduate engineering students to highlight the importance of emotional awareness and contribute to better psychological support and preventive efforts within technical education settings.

A. Research gap

To the best knowledge of the student researcher, she could not find many papers written on Automatic Thoughts by Indian authors and most researches of both the variables focused mainly on adolescents, student population, and clinical patients, very few emphasized its effect on engineering students.

III.REVIEW OF LITERATURE

This chapter comprises of the past literature reviews done by researchers on the concepts of Self-Esteem and Automatic Thoughts including the researches that are valuable to the present study as well.

A. Self-Esteem

In academic contexts, Ravikanth (2010) investigated whether economic recession is associated with decreased self-esteem among 75 academically high-performing engineering students in Andhra Pradesh. The findings revealed no significant differences in self-esteem across academic streams or programme levels during the recession period. Yadav and Thingujam (2015) explored whether hope of the engineering students is related to their self-esteem, optimism, and life satisfaction. The data was collected from a total of 300 students of Pune and the results suggested hope to be positively correlated with self-esteem, optimism, and life satisfaction. Mahadi et al. (2016) discovered that there are significant relationships between self-esteem and career decision-making as well as between social support and career decision-making among technical engineering students. The sample size comprised of 84 technical engineering students from Universiti Teknikal Malaysia Melaka. The data was evaluated using the structural equation mode and hence the relationship between self-esteem, social support, career decision-making was validated.

From a socio-cultural perspective, Sajeev and Jose (2021) found significant correlation between self-esteem and social adjustment among the tribal as well as the non-tribal students with noticeable differences in the social adjustment factor between tribal and non-tribal boys. They also examined whether assertiveness training impacts the adolescent's self-esteem and found that assertiveness training significantly increased the levels of self-esteem among adolescents. Mital et al. (2025) studied how family environment influences self-esteem and emotional or social behaviors among school-going adolescents in India and it was discovered that 61.6% of adolescents had low self-esteem, linked to unsupportive family environments, fewer friends, and parental education gaps.

In academic performance-related contexts, Crocker et al. (2003) studied the impact of grades on daily self-esteem, affect, and identification with their major. The sample was of 122 male and female students majoring in engineering and psychology. It was identified that self-esteem, affect, and identification with their major directly depended on the grade they received. Also, Harris (2009) explored the relationship between self-esteem and academic success among African American students enrolled in a Minority Engineering Program at a research-intensive university in the southern United States. The data were collected from 121 engineering students. On data evaluation, significant levels of self-esteem accompanied with positive relationship between self-esteem and academic performance was observed. Further, Seabi (2011) intended to determine the relationship between learning strategies, self-esteem, intellectual functioning and academic achievement among 111 first-year engineering students in South Africa and the outcome showed small but significant relationship between self-esteem, learning strategies, and academic achievement, with factors like positive attitude, low anxiety, effective test strategies, and organisation.

On the other hand, Thereafter, Putri et al. (2023) aimed to assess the relationship between self-esteem and self-confidence among 40 fourth-semester university students, and the outcome came out to be significant when assessing the relationship between self-esteem and self-confidence, indicating that students with higher self-esteem also reported higher levels of confidence.

B. Automatic Thoughts

With advancements in methodological approaches, Madhu Sudhan and Kumar (2021) proposed a novel multimodal deep learning approach to identify dysfunctional automatic thoughts by detecting emotions, thinking errors, and situational contexts using facial expressions, speech, and text data, which highlighted the potential of artificial intelligence–based methods in early identification of automatic negative thoughts. Whereas Shrivastava and Rathore (2021) conducted a study to explore if there is any relationship between self-silencing and automatic negative thoughts among the non-working and working mothers. After collecting data from 175, with the help of the Silencing the Self Scale and The Automatic Thoughts Questionnaire and evaluating, a positive correlation was seen of automatic negative thoughts with respect to self-silencing and that automatic thoughts can also predict self-silencing behavior.

Meanwhile in clinical health-related populations, Dhwani et al. (2022) studied the impact of automatic thoughts and body investment on psychological well-being among women diagnosed with polycystic ovary syndrome (PCOS). Using a correlational design and gathering data from 365 participants, it was found that negative automatic thoughts and low self-esteem predicted lower psychological well-being, particularly autonomy and interpersonal relations, while positive body investment predicted personal growth and purpose in life. Also, Kumar et al. (2023) aimed to find the relationship of automatic thoughts and dispositional mindfulness amongst patients with dual diagnosis. It was carried out via a descriptive correlational study design, in which 150 male patients with dual diagnosis were selected and evaluated using the Personal Information Schedule, the Automatic Thought Questionnaire**,** and the Five Facet Mindfulness Questionnaire, showing significant relationship between automatic thoughts and mindfulness among patients.

Aggarwal and Cherian (2024) researched about the influence of individual's thoughts and emotions on their resilience and well-being, emphasizing how these factors impact their daily life outcomes. A sample of 160 adults, aged 18 and above was taken. The tools used to test the hypotheses were the Automatic Thoughts Questionnaire and the Cognitive Emotion Regulation Questionnaire. The findings demonstrated that automatic thoughts and emotion regulation influence each other. It explains how negative cognition affect the way adults manage their emotions and how personal traits and cultural background can shape this link.

Schniering and Rapee (2004) examined the concept of cognitive content-specificity on children and adolescents aged 7 to 16 years. Respondents were 200 community youth and 160 clinical youth with anxiety, depressive, or disruptive behavior disorders. They completed various several self-reports and after the multivariate analyses, it was revealed that the thoughts related to loss or personal failure were most strongly linked to depressive symptoms, while the thoughts about social threat were most strongly associated with anxiety, and hostile or revenge-related thoughts best predicted aggressive behavior. Overall, the results support the idea of cognitive–affective specificity, meaning that specific thought patterns are linked to specific emotional and behavioral problems.

From a cross-cultural perspective, Calvete et al. (2005) did a cross-cultural comparison of American and Spanish Students based on the structure of automatic thoughts and relations between automatic thoughts and psychological symptoms. There were a total of 437 Spanish university students and 349 American university students taken as a sample. All were supposed to fill up the revised version of the Automatic Thoughts Questionnaire (ATQ-R) and the Young Adult Self-Report. After evaluation of the tools, automatic thoughts showed a hierarchical structure, with four specific types (dissatisfaction, negative self-concept, inability to cope, and positive thoughts) grouped under positive and negative self-talk. Also, automatic thoughts were strongly linked to anxiety, depression, and externalizing symptoms.

Boyraz et al. (2012) tested whether positive automatic thoughts moderated the relationship between event stressfulness and meaning in life. It was carried out by using standardized measures of event stressfulness, positive automatic cognitions, and meaning in life in a sample of 232 participants. The analysis revealed that the positive automatic thoughts significantly influence how stress relates to meaning in life. Individuals with high levels of positive thinking reported greater meaning in life under higher stress, whereas those with low positive thinking experienced reduced meaning in life.

In severe clinical populations, Takeda et al. (2023) investigated the relationship between negative and positive automatic thoughts and clinical variables in patients with schizophrenia. There were 36 patients with schizophrenia included. To examine the relationship, the tools used were the revised version of the Automatic Thoughts Questionnaire (ATQ-R), the Positive and Negative Syndrome Scale (PANSS), the Calgary Depression Scale for Schizophrenia (CDSS), and the Brief Assessment of Cognition in

Schizophrenia (BACS). As the result, there was no significant relationship observed between negative and positive automatic thoughts. They summarized the paper by assigning meaning to both types of automatic thoughts, with a note that each automatic thought may have different scientific features and consequences, therefore they should be considered accordingly.

Rose et al. (2024) introduced the Loneliness Automatic Thoughts Questionnaire (LATQ) and described the research evaluating its psychometric properties and correlates by creating two independent samples of university student participants. The first study consisted of 282 students involved in preliminary investigation of the psychometric properties of LATQ, while the second one consisted of 289 students, with the chance to further increase on the objective by evaluating the concurrent validity of the measure across different researches. The psychometric analyses demonstrated adequate internal consistency, and confirmatory factor analyses supported a single-factor structure of the nine-item scale. The LATQ was shown to be valid because it was strongly related to other loneliness measures as well as negative thinking. Higher loneliness-related automatic thoughts were linked to feelings of not mattering, hopelessness, anxiety, depression, and emotional pain. These thoughts also explained depression and distress beyond general loneliness, showing that how people think about loneliness is an important and separate factor. Aparicio-Flores et al. (2025) did a study to determine if statistically significant differences exist between Perfectionistic Automatic Thoughts (PAT) profiles of different intensities and the Internet interaction skills of Ecuadorian undergraduates. The tools used were the Perfectionism Cognitions Inventory and the IKANOS scale. Based on the study, the high perfectionistic demands and high PAT profiles received the highest scores in all the components of Internet Interaction skills (Code of Good Conduct, Education and Respect, Spellchecking and Comprehension, Updating of Ethical Practices). Using real-time assessment approaches, Knouse et al. (2025) explored occurrence of avoidant automatic thoughts (AAT) and their relationship with ADHD symptoms, task avoidance, and negative emotions in daily life among 106 adults. The data was collected using an Ecological Momentary Assessment (EMA) design, at baseline and up to five times per day for 6 days. Further, with the help of Multilevel modeling, it was revealed that higher baseline ADHD symptoms predicted more frequent avoidant automatic thoughts (AAT), greater task avoidance, and increased negative affect. Momentary presence of avoidant automatic thoughts was also found to be associated with inattention and task avoidance, with stronger effects observed among individuals with more severe ADHD symptoms.

IV. METHODOLOGY

A. Objective

To compare Self-Esteem and Automatic Thoughts among Male and Female Undergraduate Engineering Students.

B. Hypotheses

1) *H1:* There will be no significant difference in the Self-Esteem of Male and Female Undergraduate Engineering Students.
2) *H2:* There will be no significant difference in the Automatic Thoughts of Male and Female Undergraduate Engineering Students.
3) *H3:* There will be no significant relationship between Self-Esteem and Automatic Thoughts among Undergraduate Engineering Students.

C. Variables

1) Self-Esteem
2) Automatic Thoughts

D. Tools

1) *The Self-Esteem Rating Scale-*

The Self-Esteem Rating Scale (SERS) was developed by Nugent and Thomas (1993. It consists of 40 items, wherein the new items that were written in the scale administered a variety of areas of self-evaluation, such as social and self-competence, intellectual ability, problem-solving ability, and overall self-worth as well as the worth in relation to other people. Participants rate themselves on a 7-point Likert- type scale ranging from 1 (Never) to 7 (Always), with higher scores indicating higher self-esteem level. Some items of the scale (Q1, Q2 Q5, Q11, Q13, Q16, Q17, Q20, Q22, Q23, Q25, Q27, Q30, Q31, Q33, Q34, Q38, Q39, and Q40) were reverse scored. The final score is obtained on adding all the responses together. The draft of the scale with 40-items, was reviewed for content validity and the Cronbach's Alpha value turned out to be 0.975. Additionally, after the factor analysis, the scale was demonstrated as unidimensional where all items were loaded positively on 1 factor, with loadings ranging from 0.83 to 0.56. This factor accounted for about 54.5% of total variance. The SERS was significantly negatively correlated with measures of self-esteem problems and problems with depression, supporting validity.

2) The Automatic Thoughts Questionnaire-

The Automatic Thoughts Questionnaire (ATQ) is a 30-item questionnaire devised by Hollon and Kendall (1980) to measure the frequency of occurrence of automatic negative thoughts (negative self-statements) associated with depression. In this scale, participants rate the occurrence of automatic negative thoughts on a 5-point Likert-type scale, which ranged from 1 (Not at all) to 5 (All the time), with higher scores demonstrating higher frequency of negative thoughts. Further, all the 30 items are supposed to be added to get the final score.

After cross-validation, the ATQ significantly discriminated the depressed from the nondepressed standard groups. Factor analysis suggests a four-factor outcome, with one major first factor indicating Personal Maladjustment and a second factor depicting Negative Self-Concept and Negative Expectations. The ATQ serves as an effective tool to test the basic theories linking cognitive content to behavioral and affective processes, as well as to assess the cognitive changes in accordance with experimental manipulations or psychotherapy interventions.

E. Sample

1) Sample Population- Young Adults between the age of 18 to 25 years.
2) Sample Size- 110
3) Sampling Technique - Purposive Sampling

F. Inclusion Criteria.

- Respondents should be between the age of 18 and 25 years.
- Respondents should be either male or female.
- Respondent should be an engineering student who is pursuing bachelor's presently.
- Able to read and understand English.
- Willingness to give Responses.

G. Exclusion Criteria

- Non engineering students
- Inability to read and understand English
- Individuals with mental health issues.

H. Research Design

Comparative Research

I. Procedure

1) After deciding upon the variables appropriate questionnaires were selected to be used.
2) The questionnaires were used to collect data from Lucknow.
3) Consent letter was attached with their questionnaires.
4) Respondents were guided to read each question carefully and then answer them.
5) There was no time limit to fill the questionnaires.
6) Data was analyzed using SPSS version 27.

V. RESULT ANALYSIS

This chapter analyses the results using SPSS version 27 and have cumulated the findings into two one-way ANOVA tables and one correlation table to understand the link between Self -Esteem and Automatic Thoughts across male and female undergraduate engineering students.

The two one-way ANOVA tables compare the average Self-Esteem and Automatic Thought levels among male and female undergraduate engineering students, to check whether gender leads to any significant differences in the two. The correlation table further shows whether automatic thoughts are connected to self-esteem of undergraduate engineering students, helping determine if changes in automatic thoughts predict positive or negative changes in the self-esteem, and vice versa.

TABLE I
Showing ONE WAY ANNOVA indicating difference between Self-Esteem in Male Undergraduate Engineering Students (group 1) and Female Undergraduate Engineering Students (group 2). (N=110)

Variable	N	Mean	S.D.	Df	Mean Square	F- Statistic	Significant
Self-Esteem Group-1 Group-2	 55 55	 200.73 182.98	 32.66 35.24	1,108	8659.78 1154.647	7.500	.007

Table 1 indicates that there is a significant difference between Self-Esteem of male and female undergraduate engineering students. Thus, in this case, hypothesis 1 is rejected at 0.01 level of significance.

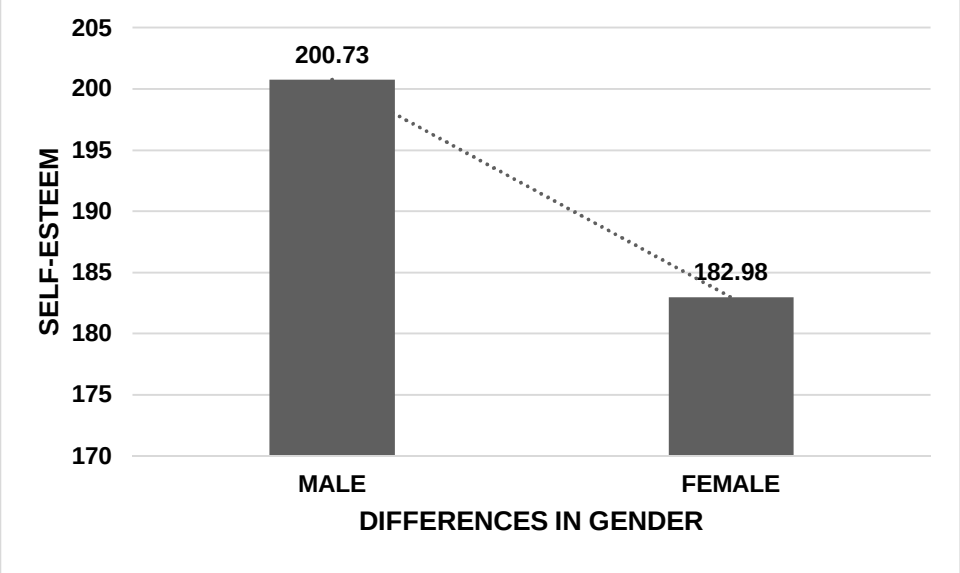

Fig. 1: Showing significant relationship between Self-Esteem of Male and Female Undergraduate Engineering Students.

TABLE III
Showing ONE WAY ANNOVA indicating difference between Automatic Thoughts in Male Undergraduate Engineering Students (group 1) and Female Undergraduate Engineering Students (group 2). (N=110)

Variable	N	Mean	S.D.	df	Mean Square	F- Statistic	Significant
Automatic Thoughts Group-1 Group-2	 55 55	 59.76 69.67	 22.142 6.22	1,108	2700.227 589.241	4.583	.035

Table 2 indicates that there is a significant difference between Automatic Thoughts of male and female undergraduate engineering students. Thus, in this case, hypothesis 2 is rejected at 0.05 level of significance.

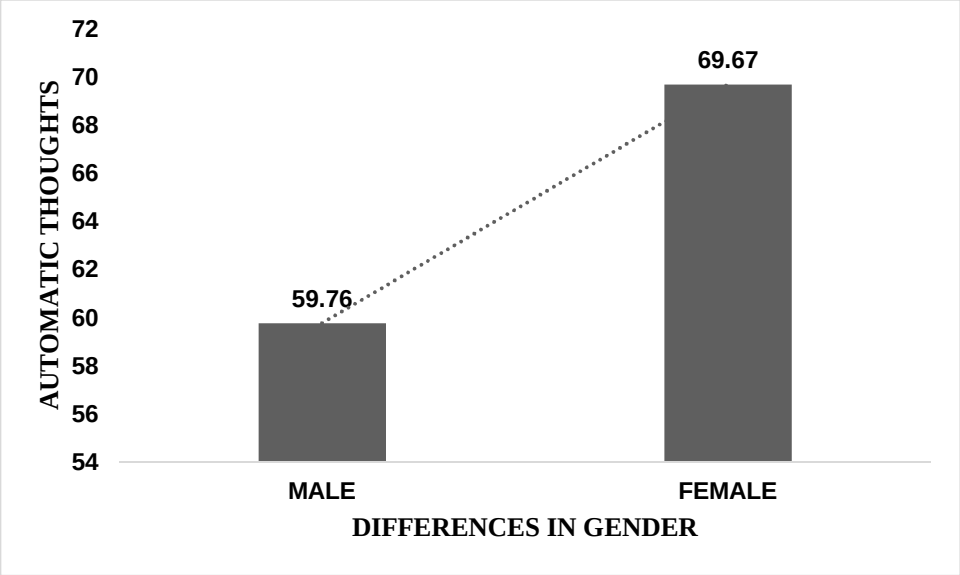

Fig. 2: Showing significant relationship between Automatic Thoughts of Male and Female Undergraduate Engineering Students.

TABLE IIIII

Showing Product Moment Correlation co-efficient among undergraduate engineering students. (N=110)

Variables	Self-Esteem		
Automatic Thoughts	'r'	Significant (2-tailed)	Remarks
	-.752**	0.001	Significant
* Significant at the 0.05 level (two tailed), **Significant at the 0.01 level (two tailed)			

Table 3 indicates that there is a significant negative difference between Automatic Thoughts and Self-Esteem among undergraduate engineering students. Thus, in this case, hypothesis 3 is rejected at 0.01 level of significance.

VI. DISCUSSION

The aim of the current research was to compare the Self-Esteem and Automatic Thoughts among Male and Female Undergraduate Engineering Students. The study collected responses from one hundred and ten young adults in the age range of 18-25 years (mean=20.38, SD=2.3).

The findings, as detailed in Table 1, reveal that there is a significant difference between Self-Esteem of male and female undergraduate engineering students. Thus, in this case, the hypothesis that there will be no significant difference in the Self-Esteem of Male and Female Undergraduate Engineering Students is rejected at 0.01 level of significance. The result thus obtained through one-way ANOVA (F= 7.500) is indicative of the fact that majority of the male undergraduate engineering students have comparatively higher level of self-esteem (mean = 200.73, SD = 32.66) than the female undergraduate engineering students (mean = 182.98, SD = 35.24). Likewise, Lahiri and Kausthub (2024) observed higher self-esteem in boys in comparison to girls among Indian adolescents. Additionally, Pop et al. (2022**)** studied the correlation between body-esteem, self-esteem, and loneliness among social media young users, and found that women reported lower levels of self-esteem than men.

Similarly, the results as per Table 2 demonstrates that there is a significant difference between Automatic Thoughts of male and female undergraduate engineering students. Therefore, the hypothesis 2 namely, there will be no significant difference in the Automatic Thoughts of Male and Female Undergraduate Engineering Students is rejected at 0.05 level of significance. The outcomes thus attained through one-way ANOVA (F= 4.583) illustrates that the female undergraduate engineering students have relatively high automatic thoughts (mean = 69.67, SD = 26.22) than the male undergraduate engineering students (mean = 59.76, SD = 22.14). Contradicting these findings, studies by Okumuşoğlu (2018) and Bibi et al. (2020), reported no significant gender differences in overall levels of automatic thoughts. However, further analysis revealed that males scored significantly higher in specific dimensions of automatic thoughts, particularly loneliness/isolation and confusion/escape.

Also, during the development of the Automatic Thoughts Questionnaire, Hollon and Kendall (1980) did not find any significant gender difference in the total automatic thought levels, meaning both males and females experience automatic negative thoughts to a comparable extent.

The results as presented in Table 3 shows that there is a statistically significant negative correlation between Automatic Thoughts and Self-Esteem among undergraduate engineering students. Hence, hypothesis 3 that there will be no significant relationship between Self-Esteem and Automatic Thoughts among Undergraduate Engineering Students is rejected at 0.01 level of significance. This explains that the relationship between automatic thoughts and self-esteem is inversely proportional in nature, that is, if an individual's automatic thoughts increase, his or her self-esteem will consequently decrease. Similar results were presented by Brueckmann et al. (2025) who established that low self-esteem increases negative thinking and burnout, and that burnout further worsens self-esteem. Furthermore, similar results were observed in research conducted by Saurabh, M. & Cherian, J. (2024) on substance-using adults. However, this finding does not consider the engineering students.

VII. CONCLUSION

The objective of the paper was to compare the levels of self-esteem and automatic thoughts among male and female undergraduate engineering students. The study collected responses from one hundred and ten undergraduate engineering students in the age range of 18-25 years. The results uncovered significant gender differences in the self-esteem, with male students displaying higher level of self-worth as compared to female students. Similarly, automatic thoughts varied significantly across genders, demonstrating that automatic thoughts differ between male and female engineering students. In addition to these gender-based differences, the study discovered a significant negative relationship between self-esteem and automatic thoughts. Suggesting that the students who undergo higher levels of automatic thoughts tend to report lower self-esteem, highlighting the harmful impact of disturbed thought processes on the overall well-being of an individual. Bringing out this study in the field of Psychology will help in making more youngsters understand about the need of awareness of the believes and cognitive processes and thereby, enforcing new styles of preventive measures for building better resilience among the students.

VIII. FUTURE IMPLICATIONS

This paper highlights the need of helping the engineering students understand their own thoughts, feelings, and emotions, making them more aware about themselves. It also suggests the need of some preventive measures such as emphasis on studying about human behavior and the self, introspective activities held in classes, attending mental health awareness workshops, free counselling services available to students at colleges, and including subjects like Behavioral Science or Life Skills.

IX. LIMITATIONS

As the sample was purposively selected and is relatively small (N=110), it may not be representative of the wider engineering student population. Thus, the results cannot be generalized to all engineering students or across genders.

X. ACKNOWLEDGMENT

I would like to express my deepest gratitude to my guide**,** for her constant support, valuable guidance, and constructive feedback, which have been pivotal in shaping the direction and quality of this review paper. Her encouragement has been a source of motivation throughout this work. I am sincerely thankful my senior, Mr. Priyanshu, for helping me with the analysis and discussion. Finally, I would also like to acknowledge my my friends and classmates for supporting me in every way.

A. Funding: No funds were taken from any person or organization for the research work.

B. Conflict of interest: There is no conflict of interest between the authors.

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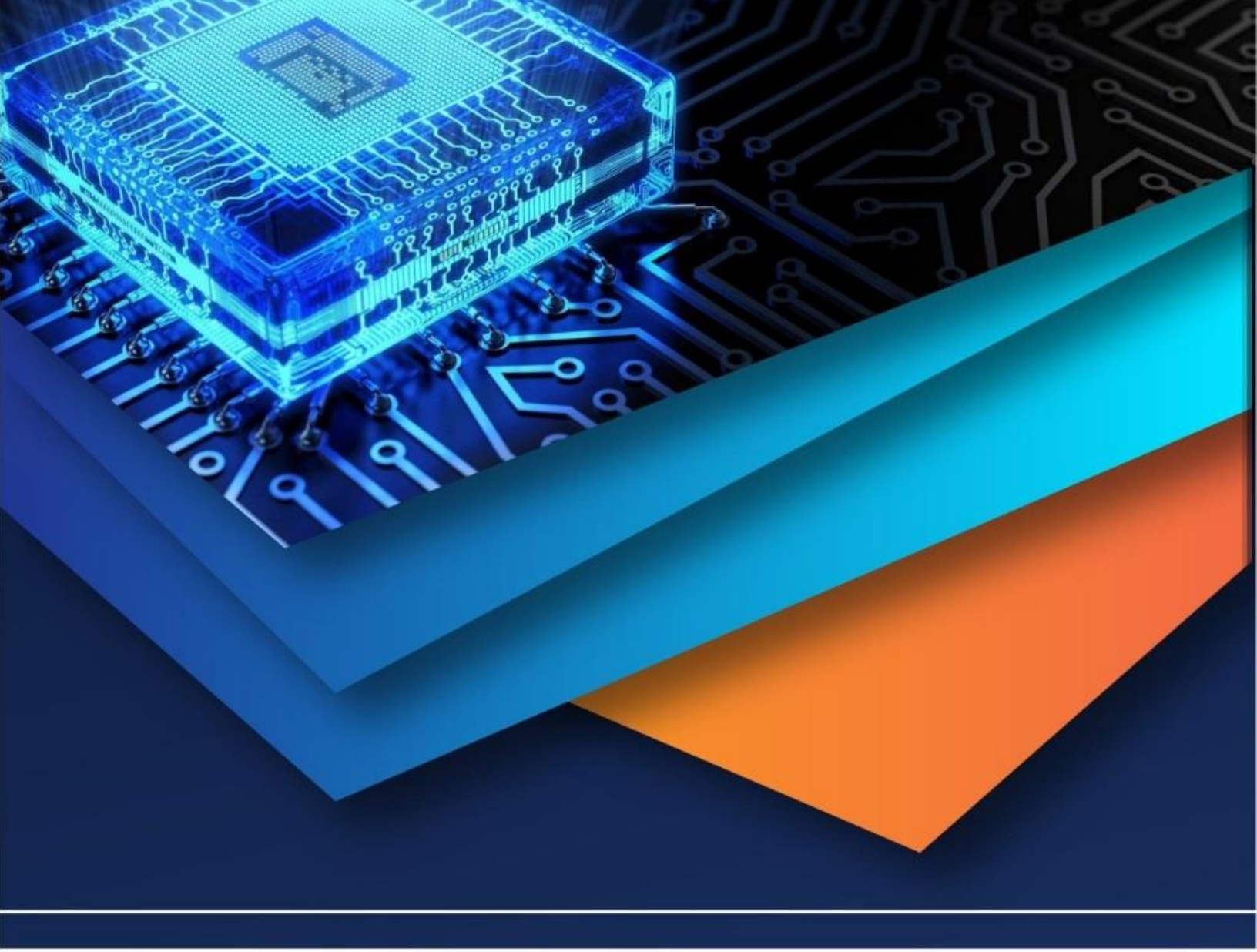

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