

# IMPACT OF STRESS OVER SELECTED PSYCHOPEDAGOGICAL ATTRIBUTES AMONG THE ENGINEERING TEACHERS

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**ABSTRACT:** *Engineering Education always has a spurt of demand of pedagogical approach of teaching rather than projected in direct learning. Teachers' style of teaching always affected by different environmental and psychological factors, associated with their day to day professional life. These professional as well as psychological factors which are affecting the pedagogical content deliberation of teachers are clubbed under Psychopedagogical attributes. These attributes include Job Satisfaction, Professional Commitment, Teaching Interest and Individualism-Collectivism. The purpose of the study was to find out the impact of Teachers' Stress over the selected Psychopedagogical attributes among the Engineering Teachers with a sample of 135 members of faculty, from 15 engineering Institutes, irrespective of management structure, which accords institutions, managed by the government [Central as also the state], philanthropic as well as Private Institutions from West Bengal. A double-staged sampling procedure, initially Cluster sampling, followed by Stratified random sampling technique was deduced to collect data by administering five Standardized Scales with regard to different measuring variable. By nature, the data were quantitative in nature and analyzed through descriptive statistics viz, Frequency graph, Mean, SD, t-test, ANOVA, Correlation. The results of the study revealed that teachers are experiencing moderately lower level of stress, which in turn elevate higher level of Job Satisfaction, Professional Commitment, moderately higher level of Teaching Interest and they exhibit moderately Collectivistic attitude towards collaborative work in their teaching profession. The correlational analysis showed that teachers possess positive significant correlation between Job Satisfaction and Professional Commitment & Teaching Interest, whereas there exists positive correlation between Professional Commitment and Teaching Interest as well as Individualism-Collectivism. The results of Juxtaposition based analysis with respect to factor as Teachers' Stress revealed that Teachers' stress does not have any significant impact over Job Satisfaction with regard to positively stressed and negatively stressed group. In context of Professional commitment and Teaching Interest, both the stressed groups differ significantly so far, their stress level is concerned.*

**KEY WORDS:** Engineering Education, Psychopedagogical Status, Teachers' Stress, Job Satisfaction, Professional Commitment, Teaching Interest, Individualism-Collectivism.

## 1. Introduction

Engineering Education is the ability of teaching knowledge and principles to the Professionals of engineering ([https://en.wikipedia.org/wiki/Engineering\\_education](https://en.wikipedia.org/wiki/Engineering_education)). Etymologically, 'engineering' seems to derive from similar roots of technology, a term, which was given philosophical basis in ancient Greece through the root 'teche', which denotes productive skill or art, which was one of Aristotelian intellectual virtues. Engineering is derived from the Latin etymological word root 'ingeniare' –which means to devise. The term engineer originated in the middle ages associated with the soldier who were dealing with construction architecture devised civilian construction (Cheville, 2014). 'The Technical and vocational Education comprises the process of Skill development workforce enable industry in country. Technical Education

refers to post-secondary course of study and practical training aimed at preparation of technicians to work as supervisory staff whereas vocational training refers to lower level of education and training for the preparation of skilled or semi-skilled workers in various trade.'(UNESCO). Engineering Education, in national scenario, is the key that enables growth for transforming India's economy. The quality of teaching and research in this sphere will play an important role to emerge our country as a global knowledge leader. In the past two decades, we have seen an eight fold increase in the number of institutions, imparting engineering education. Faculties of Technical Educational Institution play an important role in shaping the behaviour of students and to develop their intelligence and attitude to deal with the unseen complexities of life and quality education especially in the beginning year. They are considered as a core stone of successful education system (Shetty et al, 2018).

According to Banerjee and Muley Report, Engineering education in Indian context, having a spurt for opting this stream by brightest student after XII<sup>th</sup> standard as there is a high chance or probability of securing job in software competing globally, automobiles, chemicals and engineering institutes. However, there is a dearth of employment which is underpinning due to poor quality of education, which is somehow based on the stakeholders as teaching community who are actively engaged in imparting education for skill development.

The generalized goal of engineering education, irrespective of levels and nationals' boundaries is to prepare pupils to practice engineering as profession and also to spread technological literacy, increase student's interest and technical vis-à-vis technological careers through science and mathematical education, accompanied with hands-on-learning (Roy & Paira, 2010).

The future success of Indian economy depends on the growth of quality engineering education in India. Engineering education in India perused tremendous growth over the past decade. The number of graduates coming out of technological colleges increased to over 700,000 in 2011 from 550,000 in 2011 (Nandankumar,2011). As akin to general education, engineering education produce a set of well-skilled professionals in respect to psychomotor domain of Bloom's Taxonomy. As like arts, humanities perform to develop knowledge in respect to Cognitive domain associated affective sense that make the system as a distinctive one (Tilak, 2001).

The chronological development in engineering education has become under point of scrutiny. Regardless studies have been come under focus point like that very little effort has been made over the rapid changes of central as well as government institution and industry-based enquiries in respect to engineering education. Very little effort was attempted to dilute addressing of dissatisfaction of engineering faculty in context of their job and associated psychopedagogical attribute (Roy & Paira, 2008).

In higher education, pressure is mounting from the general public, management, work atmosphere, as well as state and central government policies to increase productivity and efficiency. These pressures are likely to intensify the stress experienced by the members of engineering faculty. Stress in the profession is found when job-demand is difficult for carryout by the faculty. A survey at a research university, found that most members of faculty described their job fairly stressful due to competing demands (Olsen & Mapple, 1993).

The present exponential rate of change in society has drastically lowered predictability and uncertainties. It is to be agreed upon that social change contributes a cultural lag between technological development and social change. Science and technology as well as engineering have a symbiotic relationship. But science is preoccupied with understanding and explaining, while engineering is concerned with doing, realizing and implementing. Therefore, the aim of future engineering

education ought to be integration of knowledge, sequel of skill, understanding and experience, tagged with the status of teachers in general and of their psychopedagogical status in specific. Now days, there is a prediction in context of Indian Engineering Education that Space, Computer, Energy and Communication will be the main technology drivers in the contemporary era, with Materials Science and Engineering qualifying as the underpinning technology (*Banerjee & Muley, 2007*).

In recent years, our educational system has become the target of widespread scrutiny and criticism, while at the same time the rewards of teaching are often obscured by the difficult working conditions that are prevalent in many of our Institutions. Against this backdrop of heightened job pressure and reduced professional satisfaction, it is not surprising that alarming statements have been issued repeatedly in the educational literature about the growing prevalence of teacher's stress and burnout (*Borg, 1990; Cox & Brockley, 1984; Farber, 1984, 1991; Hodge, Jupp, & Taylor, 1994; Holt, Fine, & Tollefson, 1987*).

Many researchers observed that stress narrow-downs the thought-process of people which curb down their creative potentials. Today the teacher faces numerous negative stressors in their day to day life by which the teacher is becoming less satisfied and committed towards their job. Some of the outcomes of stress can include job dissatisfaction, decreased absenteeism from the workplace, lowered turn over, decreased performance and reduced job-related productivity and reduced efficiency especially for teachers towards Teaching.

Irrespective of level and types of education, teachers always play a pivotal role to formulate and implement policies concerning education as well as imparting education most effectively for quality enhancement which will be effected by sequel of associated factors and variables, termed compositely as Psychopedagogical attributes with regard to their teaching profession in engineering education system.

## **2. Review of Related Research literature**

The existence of the present always rests on the foundation of the past. A view of history always ascertains the firmness of our past glimpse of our present situation. Hence, a summary of writings of recognized authorities and of previous research provides evidence what is still unknown and yet to be testified. Literature review provides the researcher with the footprints of earlier travelers gone ahead on the same route; they save him from the pitfalls and help him in removing the hindrances, which are likely to come on his way. Related literature works as a guide-post not only with regard to quantum of work done in the field, but also enables us to perceive the gap and lacuna in the concerned field of research. Here the researcher intends to study about the impact of Teachers' stress and over allied psychopedagogical attributes like Job Satisfaction, Professional Commitment, Teaching Interest, Individualism-Collectivism of teachers working in Engineering Education. So, the researcher took a glimpse of past studies carried out in India and abroad over Teachers' Stress and its effect over the specified psychopedagogical attributes, like Job Satisfaction, Professional commitment, Teaching interest, Individualism-Collectivism and also want to examine whether there remains any relationship among those above spelt attributes?

### **2.1. Studies based on Teachers' Stress**

Good many studies were conducted in 'Stress' as a variable in India as well as abroad. There were many educationists who had taken up a step to study over various stressors leading to stress in many job holders/ teachers and their impact over job satisfaction. *Shahab et. al. (2013), Bhatti et al. (2011), Klassena et al.(2010), Sen, K (2008) Borg et al. (1991)*, followed similar pattern and their studies revealed that there were different determinants like role conflict, role

ambiguity, home-work interface and work-over load as predictors of job stress identified and they have significant effect over job stress and stress was negatively correlated with Job Satisfaction, career commitment and greater number of absenteeism.

*Jena, S.S (2013) and Roy, R. et al.(2010)* carried out studies over 'Professional Stress' as Psychopedagogical attributes and examined the effect of teaching experience, age over Professional Stress and studies revealed that there was positive and direct effect of age and teaching experience over Professional Stress.

Various educationist aimed to attribute 'Stress' in different terms viz. work stress, job related stress, occupational stress, organizational role stress and also explore these 'stress' variable linkage with other different variable relationship. Such as *Singh et al. (1984)* found a significant positive relationship between Occupational stress and Job Involvement. Whereas *Pearson et al. (2005)* in the same vein examined as curriculum autonomy increased job stress in turn decreased job satisfaction associated with a lower degree of professionalism and empowerment. *Yang et al. (2009)* also examined another relationship between quality of life and occupational stress among Chinese teachers. In the findings of research work conducted by *Liou, K.(1997)* perceived different job related factors like Job security, work conflict and role ambiguity leads to positively associated with higher level of stress. Subject respondents were found higher in organizational role stress were found to less involved in the study of *Singh et al. (1991)*.

## 2.2. Studies based on Job Satisfaction

A good number of experimental studies carried out on Job Satisfaction of teachers as well as different professionals. Studies as 'Effect of Job Stress/Burn out/Occupational Stress over job satisfaction in respect to demographic variables' had been conducted by different educationist as researchers like *Kitchel et al. (2012)*, *Bhatti et al. (2011)*, *Shukla, R. N. (2011)*, *Chenevy et al. (2008)*. Their studies revealed that there was a significant negative relationship found in between Job Stress and Job Satisfaction. Sometimes demographic variables/factors had no significant effect over job satisfaction. The in-depth analytical study of *Samwel, J. (2018)* explored in his research that there is a significant positive relationship between employee's job satisfaction and the level of commitment and performance in solar companies. And also to a larger extent the companies also perceive well the mechanism of job satisfaction affecting their employee's commitment and work performance. *Stephanou et al. (2013)* wanted to examine the impact of teacher's self efficacy beliefs over collective-efficacy beliefs and collective-efficacy beliefs over job satisfaction. The findings explored that teacher's self-efficacy had positive effect on school collective efficacy beliefs and job satisfaction and Collective efficacy beliefs on the job satisfaction. *Klassena et al.* observed in his study that cultural dimensions of collectivism were significantly related to job satisfaction for the Korean, not for North Americans. *Cherabin (2012)*, *Sharma, T. (2012)* in their study found that the impact of demographic variables over Job Satisfaction, Organizational Commitment and their relationship. The study revealed that there were no significant effects of demographic variables over Job satisfaction of teacher of Tehran but in Mysore. Job Satisfaction is showing significance relationship with Organizational Commitment.

## 2.3. Studies based on Professional Commitment

Extensive analysis by different researcher such as *Demirok, M.S.(2017)* showed that there is a moderately positive correlation between career satisfaction and professional commitment of special education teachers' level of Professional commitment. *Mary, P. (2016)* aimed to find out the level and status of Professional commitment of College Teachers in relation to their social characteristics. The findings of the study concluded that significance difference does not exist in respect to professional commitment and their dimensions among different types of college teachers i.e. autonomous and

non-autonomous college, Arts-Science and B.Ed. college Teachers but Significant relationship exist between Professional commitment and its dimension with social characteristics like Tolerance, Cooperation of college teachers. *Cherabin et al. (2012)* conducted a study to explore interrelationship among Job Satisfaction, Self Esteem and Professional Commitment between teachers working in Mysore and Tehran. Study results revealed that Organizational Commitment of faculty members was significantly related to both Job Satisfaction and Self Esteem for all the teachers. Both for the teachers from Mysore and Tehran, Job Satisfaction and Organizational commitment were mutually related. *Wilson et al. (2012)* examined the teaching- related stress, self-efficacy and occupational commitment of pre-service teachers from two culturally western and two culturally eastern countries. The results of this study revealed that Self-efficacy partially reduced (mediated) the effect of stress from student-behavior and from workload on commitment and also teachers' self-efficacy changes the way in which work-stress influences the commitment to continue teaching, although cultural milieu influences the nature of the relationship according to context.

#### 2.4. Studies based on Teaching Interest

The interrelationship studies conducted by *Babu, R. (2017)* and *Theresu et al. (2017)* explored that teacher educator experience high level of occupational stress and have average level of teaching interest there is positive and non-significant relationship found between occupational stress and teaching interest. *Boli, G.(2017)*'s study observed that the co-efficient of correlation value for tribal and non-tribal teachers were significantly negative correlation for tribal teachers and significantly positive correlation for nontribal teachers found between aptitude and interest of teaching. *Laskar et al. (2014)* inferred that most of the college teachers felt positively interested in teaching, consider that teaching is an ideal job and most prestigious job than others. *Syiem, I. (2014)* found that there is no significant difference between male and female, graduate and post graduate teacher trainees in interest in teaching. *Suganthi, M.(2011)* documented that there is no significant difference exist between Job Satisfaction and Teaching Interest of D.T.Ed. Teachers.

#### 2.5. Studies based on Individualism-Collectivism

Study carried out by *Kececi, M.(2017)* to demonstrate the impact of individualism and collectivism on organizational citizenship Behaviour (OCB). The results of the study revealed that both individualism and collectivism have a positive and meaningful correlation with Organizational Citizenship Behaviour (OCB). The correlation between collectivism and OCB is stronger in relation to individualism and OCB. *Singh et al. (2015)* examined the role of life events Stress and Individualism-Collectivism in predicting Job Satisfaction. The findings indicated that Collectivism was found to be significantly and negatively correlated with Job Satisfaction. Individualism-Collectivism was found to be significant predictors of job satisfaction. Managers who scored high on positive life events stress and individualism were found to be higher on job satisfaction than those who scored high on negative life events stress and collectivism. *Jena, S.S (2013)* conducted research study to explore the impact of age over psychopedagogical attributes like Professional Stress, Professional Commitment, Individualism-Collectivism and Job Satisfaction. The Study revealed that the age of the respondents possess significant impact over Individualism-Collectivism. Respondents belonging to middle age group exhibit individualistic trait much than the collectivistic approach. *Roy, R. et al. (2010)* found out that span of experience do not possess significant impact over Collectivistic traits of the respondents. Respondents belong to lower group exhibits individualistic trait much than the collectivistic trait, compared to the senior experience groups. *Yetim, N.(2006)* wanted to analyse whether cultural orientation which were pervasive and salient in the society of SME's entrepreneurs predict employees job satisfaction. Paternalism, Collectivism, individualism, power distance, uncertainly avoidance was assessed as

pervasive and salient attributes for Turkish Society. The findings of the study revealed that Job Satisfaction and two entrepreneurs characters namely paternalism and Collectivism were positively correlated at moderate level where as Worker Job satisfaction and power distance were positively correlated at significant level.

### 3. Defining Key Attributes

The key attributes on which the present study hinges on, are: Job Satisfaction, Professional Commitment, Teaching Interest and Individualism-Collectivism, which are potentially effected by Teachers' Stress. Together, the psychopedagogical attributes collectively form the Psychopedagogical status of the sample group of respondents for the present investigation. Hence the researchers initiated the study, titled, 'Impact of Stress over selected Psychopedagogical attributes among the Engineering Teachers'.

#### 3.1. 'Psychopedagogical Status'

The term 'Psychopedagogy' is a combination of Psychology and pedagogy to explore the impact and practices of psychology in pedagogy, i.e., teaching learning process, as prevalent by the teachers, who often act as pivot of the entire pedagogical set-up. This Key word first coined by *Stone, E.* way back in 1979 in his book 'Psychopedagogy: Psychopedagogical theory and Practice'.

For the sake of present investigation, the terminology, 'Psychopedagogy' will denote the attributes namely, teachers' professional commitment, their job-satisfaction, teaching interest and individualism-collectivism. The researchers have adopted this terminology to find out the 'psychopedagogical status' in context of their teaching profession.

#### 3.2. 'Teachers' Stress'

According to Hans Selye '*Stress refers to non specific response of the body to any demand made upon it*'. The word 'Stress' is defined by the Oxford Dictionary as '*a state of affair involving demand on physical or mental energy*'. A condition or circumstances (not always), which can disturb the normal physiological and psychological functioning of an individual. In medical parlance 'stress' is defined as a perturbation of the body's homeostasis (Maslow, 1968; Aiken 1984).

*Claxton (1989)* indicated that teaching is an occupation which is always demanding and changing. On the other hand, stress possesses physical and emotional effects on us and can create positive and negative feelings. As a positive influence (eustress), stress can help and compel us to act; it can result in a new awareness and an exciting new perspective. As a negative influence (distress), it can result in feelings of distrust, rejection, anger and depression. Occupational stress is defined as the perception of a discrepancy between environmental demands (stressors) and individual capacities to fulfil these demands (*Topper 2007*).

Occupational stress in context of the present investigation will denote teachers' Stress, Which occurs when teacher subjectively experiences an incompatibility between himself or herself and his or her work environment, and feels unable to cope, adapt or function effectively as a result of which s/he endures poor mental or physical health or engages in dysfunctional and even counterproductive behaviours.

#### 3.3. 'Job Satisfaction'

*Hoppock (1935)* defined job-satisfaction as any combination of psychological, physiological and environmental circumstances that cause a person truthfully say, I am satisfied with job. According to *Locke (1983)*, job satisfaction refers to rewarding nature of a person's work and has been defined as a pleasurable or positive emotional state resulting from the appraisal on one's job or job experience.

Sense of inner-fulfillment and pride achieved when somebody is performing a particular job. Job-satisfaction occurs when a teacher feels that s/he has accomplished something having importance and value-worthy of recognition and of sense of joy, (Roy et al., 2010).

For the sake of the present investigation, the terminology is considered as the sense of inner fulfilment and pride achieved when educators, involved in teaching liberal, professional and engineering education system.

### 3.4. 'Professional Commitment'

Simpson and Hood (2000) defined commitment in the context of the teaching profession. They hold that '*a committed teacher reflects certain behavioral characteristics. He shows that professional development is a top priority; reflects excitement about teaching and learning; connects with students; shows positive attitude about students; is perceptive about student motives, strengths, needs and situations*'.

In the context of the teaching profession, the importance of teacher commitment has been highlighted by Dave (1988). He states that 'Teacher effectiveness is not automatically insured by professional competencies and practical skills only. One of the reasons of the phenomenon is that the actual performance of trained teacher in the classroom or school in a consistent manner is equally dependent, if not more, on their commitment to perform well. It is this commitment component that plays a decisive role'.

The concept of professional commitment signifies an attitude reflecting the strength of the bond between an employee and an organization. Most of the authors define the concept as '*the strength of an individual's identification with the involvement in an organization*' (Morrow, 1993).

For the present investigation, the terminology is considered as the sense of inner-accountability of the teacher from liberal, professional and engineering disciplines.

### 3.5. 'Teaching Interest'

Interest, according to Vernon (1967) is just a '*complex*' like an amalgam of subjective feelings and objective behavior, i.e., the tendencies, which vary in intensity and from object to object. As the important component of psychopedagogical attributes, interest is an established set of dispositions, resulting from experience and it determines resulting behaviors'.

C.V.Good defined interest as '*a subjective-objective attitude, concern of condition involving a percept or an idea in attention and a combination of intellectual and feeling consciousness, may be temporary or permanent based on nature, curiosity, conditioned by experience of any preference displayed when choice are available*'.

According to Penguin Dictionary of Psychology, the term 'Interest' is employed in the following two sense:

1. *The functional interest*: It determines a type of feeling, earned by experience, which might be called 'worthiness'- and associated with attention to an object or course of action.
2. *The structural interest* : It indicates an element or item in an individual's makeup, either congenital or acquired , because of which individual tends to have his feeling of 'worthiness' in connection with certain subject matters relating to a particular field of knowledge.

The present investigation uses the term 'teaching interest' so as to find out the tendency of the teachers from different level of education systems, considered for the study, and further, towards their profession-which may either be positive or negative, or even, can be null.

### 3.6. 'Individualism-Collectivism'

Collectivism is defined as a human (and also non-human) propensity which guides the organism to follow the principle of extending priority over group than that of an individual. Individualism is just the reverse principle where the group priority is dominated by individual priority (Goldman, 1991, 2004). However in Psychopedagogy, individualism is perceived as a trait, (which in course becomes habit) of being independent and self-reliant. Individualism is also perceived as a brewing factor of egoism (Roy, 2007).

One of the works on individualism-collectivism is conducted by Triandis (1995). He proposes four dimensions of individualism-collectivism. The first dimension is related to the conception of the self. Individualists define self as autonomous from groups, while collectivists see themselves as interdependent with others. The second dimension is associated with goal relationships. Tendency of individualist to place higher priority on individual goals, while collectivists take precedence in-group goals over those of the individual.

The third dimension concerns the relative importance of attitudes and norms. Triandis (1995) argues that social norms, duties and obligations shape the behaviors of collectivists, while individual attitudes and preferences shape the behaviors of individualists. The fourth dimension is related to the concept of emphasis placed on relationships. Collectivists place a high emphasis on relationships and harmony, while individualists tend to view relationships as a means to achieve individual goals (Dakhli, 2009).

For the present study, individualism-collectivism is considered as a trait-continuum, which is reflected through the person's positional existence in trait (measuring) scale.

Project method of learning as collaborative engagement for attaining a whole hearted activity completed through only cooperation in educational setup. It is noted that engineering education depends on manipulative skill, observation skill, drawing skill and team effort is essential for gaining skilled human force for quality education. In the spectrum of present arena, it is interesting to place under focus that engineering education system. Belief in learning by doing principle, where practical works and laboratory activities can be completed by collective effort with guidance from teacher. As an important factor, Collectivism among the teacher community is truly a supporting factor disseminating set of skill to knowledge learner will have a higher level of collective efficacy which will be highly influenced by the very characteristics of teacher.

### 4. Objectives of the Study

Being acquainted with the researches already conducted, the researchers present the following objectives for the present research:

- 1) To explore the level of stress of teachers and allied psychopedagogical attributes i.e. job Satisfaction, Professional Commitment, Teaching Interest, and Individualism-Collectivism of the teachers working in Engineering Education System.
- 2) To compare the extent of Stress among the teachers working in Engineering Education System in terms of Gender (Male and Female), Teaching Experience (in terms of duration, viz., lower, middle, higher), level of teaching i.e. Post Graduate (M.Tech.) & Undergraduate (B.Tech.).
- 3) To find out the internal correlation among the above spelt four psychopedagogical attributes of different level of teachers from Engineering Education System.
- 4) To find out the effect of Teacher's Stress over the selected psychopedagogical attributes in terms of Positively Stressed and Negatively Stressed group.



## 5. Methodology of the Study

Methodology, following which the present study was conducted is as follows:

### 5.1. Sample

The sample of this present investigation comprised of 135 members of faculty, from 15 engineering Institutes, irrespective of management structure, which accords institutions, managed by the government [Central as also the state], philanthropic as well as Private Institutions from West Bengal.

In this investigation, a double-staged sampling was adopted for the study. Firstly, cluster sampling technique was adopted to draw sample in terms of clusters like area–Rural, Urban, Suburban and Institutes with management structure, i.e., Govt., Private and Philanthropic organizations.

Stratified random sampling technique was implied to draw sample from the clusters and stratification was done in terms of following strata - Gender (Male & Female), Age Group (Lower, Middle, Higher), Teaching Experience ( Low, Middle, High).

### 5.2. Tools

To explore the psychopedagogical attributes with Teachers' Stress, five sets of Standardized Scales developed by the different researcher have been adopted in respect to present research study which includes:

#### 5.2.1. Teachers' Stress Scale (TSS)

To measure the level of Teachers' Stress of the respondents as sample of the study, the TSS, validated and Standardized Scale was administered over the sample of the concerned study. The Scale was developed in questioning cum statement pattern including 23 items with a scale range from 23 to 69 and a midpoint is 46. This scale is three-point Likert Scale. All the items scored as: Often-3, Sometimes-2, Rarely-1, developed by the Psychology Research Unit of Indian Statistical Institute [ISI].

#### 5.2.2. Job Satisfaction Scale (JSS)

To ascertain the level of Job Satisfaction of respondents as sample, Job Satisfaction Scale as JSS with the 75 items based Likert Type version was administered, developed by Y.Mudgil, National Psychological Corporation (2012). This scale items ranges from 75 to 375 and bearing a midpoint is 225. Those were presented on five-point Likert Scale. The reliability coefficient was 0.95 which is significant at 0.01 level of significance.

#### 5.2.3. Professional Commitment Scale (PCS)

To measure the level of Professional commitment of teachers working in sample frame in study, Professional Commitment Scale (PCS) was administered over the respondent group. This Scale consists of 33 items based on five-point Likert Scaling Technique, developed by Dr, Poorva Jain, Agra Psychological Research Cell (2015). This scale items ranges from 33 to 165 and bearing a mid-value is 99. The reliability coefficient of this scale was 0.89.

#### 5.2.4. Teaching Interest Scale (TIS)

To measure the level of Teaching Interest of teachers, Teaching Interest Scale (TIS) was administered over the respondents and the scale incorporates 30 items, with proportionate positive and negative ratio, placed in a five-point Likert's Scale with a scale, ranging from 30 to 150 and mid-point 90. The Scale bears reliability coefficient 0.84, developed by the Psychology Research Unit of Indian Statistical Institute [ISI].

5.2.5. Individualism-Collectivism Scale (ICS)

With a view to measure the individualism-collectivism attribute of the sample, the ICS was administered. The scale is a seven-point Likert Scale, incorporating sixteen items with proportionate positive and negative item ratio, placed haphazardly on the Scale. Scale range from 16 to 112 with a midpoint of 64 and a reliability coefficient is 0.86, and developed by the Psychology Research unit of Indian Statistical Institute [ISI].

5.3. Data

Data were collected from the respondents by administering the scales. By nature, collected data were quantitative; and were analyzed through descriptive statistics, Correlation, 't' -test and ANOVA.

6. Findings

Findings of the present investigation are as follows:

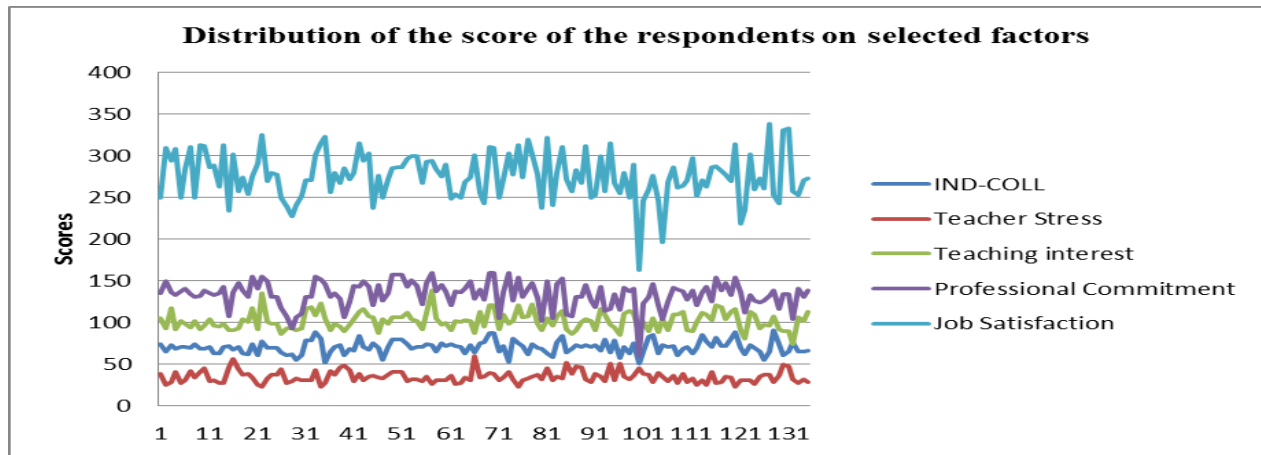


Figure 1: Distribution of the score of the respondents (Total group, N=135).

Table 1: Observation of the total groups in terms of M and σ

Observation (N=135)	Teachers' Stress	Job Satisfaction	Professional Commitment	Teaching Interest	Individualism-Collectivism
M	34.60	275.77	133.49	101.78	70.17
σ	7.06	27.82	15.56	10.75	7.68

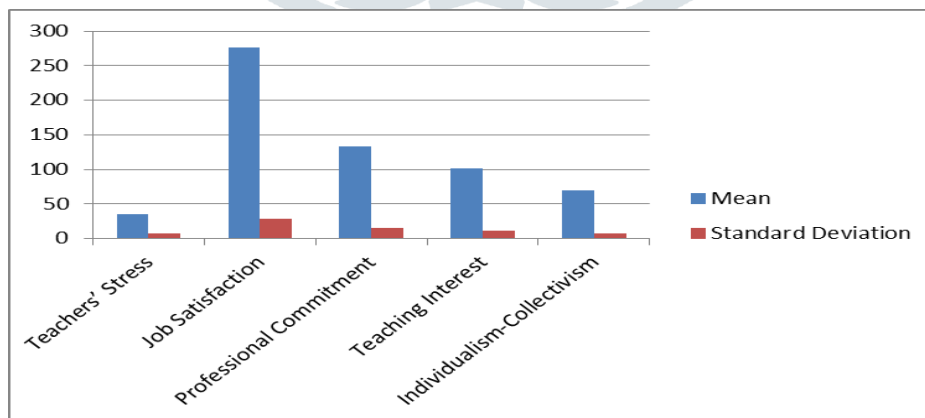


Figure 2: Distribution of Mean (M) and Standard deviation of Teachers' Stress and allied Psychopedagogical attributes (Total group, N=135)

Analysis of the data over the total group of respondents (N=135) reveals that

- (i) So far, the Teachers' Stress is concerned, the group of respondents possess moderately lower level of stress of teachers (M=34.60, σ=7.06) in Teachers' Stress Scale.

- (ii) In terms of Job Satisfaction measurement of teachers, the respondents exhibit comparatively higher level of Job Satisfaction ( $M=275.77$ ,  $\sigma=27.82$ , Mid-point=225) in Job Satisfaction Scale.
- (iii) Keeping in view the Professional Commitment, the group respondents of teachers reported towards higher level of Commitment ( $M=133.49$ ,  $\sigma=15.56$ ) towards their teaching profession in Professional Commitment Scale.
- (iv) In respect to ascertain of Teaching Interest, the respondents as teacher exhibit moderately higher level of teaching interest ( $M=101.78$ ,  $\sigma=10.75$ , Midpoint=90) in Teaching Interest measuring Scale.
- (v) So far, the Individualism-Collectivism trait is concerned, the group respondent possess towards Collectivistic attitude towards their profession ( $M=70.17$ ,  $\sigma=7.68$ , Mid-point=64) in Individualism-Collectivism trait measuring Scale.

**Table 2:** Observation of comparative level of Teachers' Stress, based on Gender

Gender	Observation (Total-135)	Mean	Standard Error	Standard Deviation ( $\sigma$ )	't'-value	df	P value	LoS (0.05 level)
Male	110	34.69	0.679	7.122	0.289	133	0.774	NS
Female	25	34.24	1.39	6.959				

Analyzed data as depicted in Table 2 revealed that respondents belong to male and female gender group under comparison, and are working in engineering education system exhibits no significant difference of Stress level in terms of gender, since here P value is greater than 0.05 at 5 % level of significance.

**Table 3:** Comparison of Teachers' Stress based on Age Group (Lower Age Group and Middle Age group)

Group under Comparison	Factor	N	Mean	Standard Error	Standard deviation ( $\sigma$ )	df	't'-value	P Value	LoS (0.05 level)
Lower Age Group	Teachers' Stress	38	36.00	1.04	6.43	114	0.795	0.428	NS
Middle Age Group		78	34.89	0.82	7.26				

Table 3 revealed that respondent belong to Lower age group did not differ significantly in terms of Teachers' Stress in comparison to respondent belonging to Middle Age group. Here, thought respondent of Lower Age group possess comparatively higher level of stress in contrast to thought respondent belonging to Middle Age Group.

**Table 4:** Comparison of Teachers' Stress based on Age Group (Lower Age Group and Higher Age group)

Group under Comparison	Factor	N	Mean	Standard Error	Standard deviation ( $\sigma$ )	df	't'-value	P Value	LoS (0.05 level)
Lower Age Group	Teachers' Stress	38	36.00	1.04	6.43	55	2.98	0.0042	Significant
Higher Age Group		19	30.63	1.44	6.30				

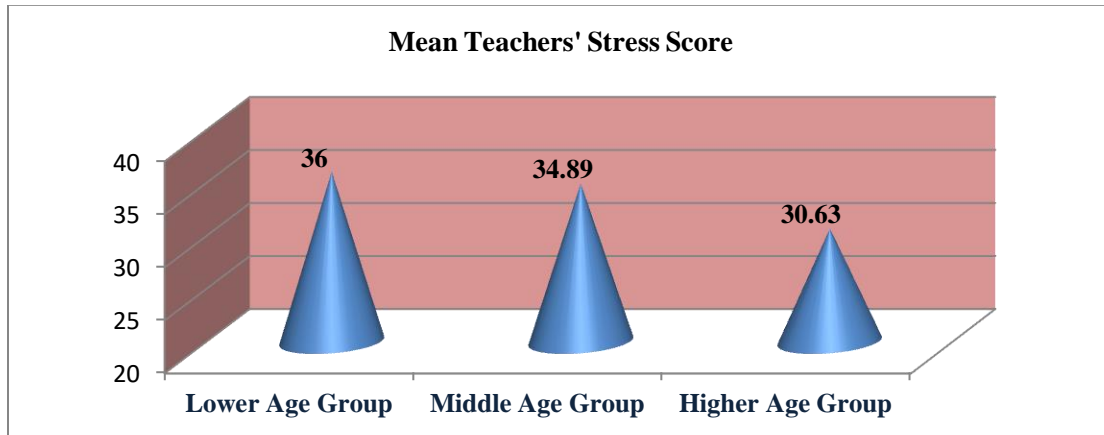
In contrast to preceded findings, Table 4 revealed that respondent belonging to Lower Age group differ significantly of stress level from respondent belonging to Higher Age group so far Teachers' stress is concerned. Lower Age group exhibit moderately higher level of stress in contrast to its counterpart group respondent belonging to Higher Age Group.

**Table 5:** Comparison of Teachers' Stress based on Age Group (Middle Age group and Higher Age group)

Group under Comparison	Factor	N	Mean	Standard Error	Standard Deviation ( $\sigma$ )	df	't'-value	P Value	LoS (0.05 level)
Middle Age Group	Teachers' Stress	78	34.89	0.822	7.26	95	2.34	0.020	Significant
Higher Age Group		19	30.63	1.447	6.30				

It is apparent from the Table 5 revealed that Middle Age group respondent reported comparatively higher level of stress in compare to its counterpart respondent group as Higher Age Group. So far, the stress level is concerned, significant

difference exhibit between these two groups respondent at 5 % level of significance as calculated P value is less than 0.05.



**Figure 3:** Mean Teachers' stress score in differing age group (Total group, N=135)

So far, the preceded findings is concerned focused on the study, it is apparent to note from figure 3 that Age group also identified for having significant effect on Stress level of Teachers' which is reducing in accordance with the increase of age of group respondent.

**Table 6:** Observation of comparative level of Teachers' Stress based on Span of Teaching Experience (Lower Experience group and Middle Experience group)

Group under Comparison	Factor	N	Mean	Standard Error	Standard Deviation ( $\sigma$ )	df	't'-value	P Value	LoS (0.05 level)
Lower Experience group	Teachers' Stress	47	35.80	0.89	6.14	116	0.74	0.45	NS
Middle Experience group		71	34.83	0.88	7.45				

As per comparative analysis of data of Teachers' stress attribute based on span of teaching experience, Table 6 revealed that respondent belonging to Lower Experience group did not differ significantly of stress level from respondent belonging to Middle Experience Group at 5 % level of significance as calculated P value is greater than 0.05. Lower Experienced Respondent group possess marginally higher amount of stress level in compare to Middle Experienced group respondents but their difference is significant at any standard level of measurement.

**Table 7:** Observation of comparative level of Teachers' Stress based on Span of Teaching Experience (Lower experience Group and Higher Experience group)

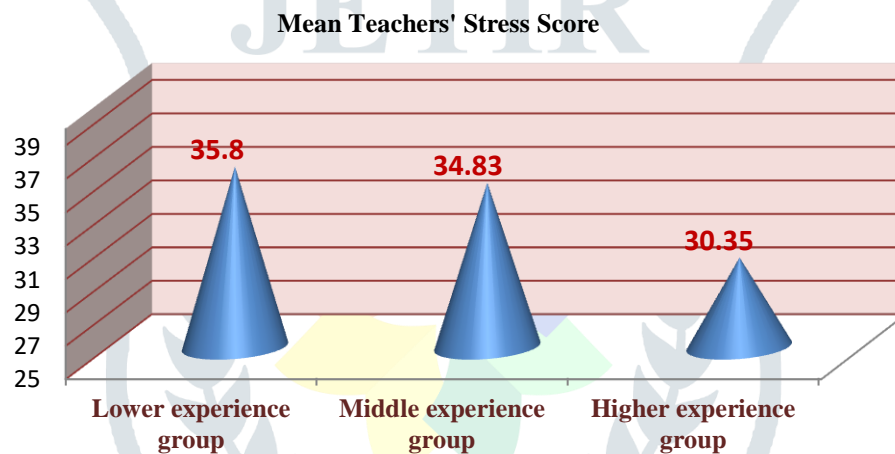
Group under Comparison	Factor	N	Mean	Standard Error	Standard Deviation ( $\sigma$ )	df	't'-value	P Value	LoS (0.05 level)
Lower Experience group	Teachers' Stress	47	35.80	0.89	6.14	62	3.07	0.0031	Significant
Higher Experience group		17	30.35	1.59	6.56				

It is apparent from Table 7 revealed that respondent belonging to Lower Experience group differ significantly of stress level in compare to its counterpart respondents belonging to Higher Experience Group as P value is less than 0.05 at 5 % level of significance so far stress is concerned. Respondent belonging to Lower Experience group exhibit comparatively higher amount of stress compared to Higher Experienced Group respondents.

**Table 8:** Observation of comparative level of Teachers’ Stress based on Span of Teaching Experience  
(Middle experience Group and Higher Experience group)

Group under Comparison	Factor	N	Mean	Standard Error	Standard Deviation ( $\sigma$ )	df	‘t’-value	P Value	LoS (0.05 level)
Middle Experience group	Teachers’ Stress	71	34.83	0.88	7.45	86	2.27	0.025	Significant
Higher Experience group		17	30.35	1.59	6.56				

Keeping in view of observation of comparative level of Teachers’ stress, Table 8 revealed that respondents belonging to Middle Experience group differ significantly of stress level in compare to respondent belonging to Higher Experience Group at 5 % level of significance. Here, Respondents group from middle experience category exhibit comparatively lower higher amount of stress level in contrast to its counter experienced group as Higher Experienced Group respondents.



**Figure 4:** Mean Teachers’ stress score in differing experience group (Total group, N=135)

From the above three findings pointed out the significant effect of span of teaching experience on differing stress level of respondents belonging to different experienced group. Where it is revealed that span of teaching experience marked a significant impact on differing the stress value of teachers in engineering Education System. The study observed that Teachers’ stress reduces in consonance with the span of teaching experience.

**Table 9:** Observation of comparative level of Teachers’ Stress based on Department/Stream

Department	Observations (Total-135)	Mean (M)	Standard Error	Standard Deviation ( $\sigma$ )	‘t’-value	P value
B.Tech.	100	35.3	0.7303	7.303	1.944	0.0540
M.Tech.	35	32.628	1.0167	6.015		

Table 9 reveals that respondents engaged in teaching at Bachelors’ and Masters level under comparison in Engineering Education system differs significantly to their stress level since here the P value is less than or equal to 0.05 at 5 % level of significance. Respondents engaged in teaching at UG level (B.Tech) possess significantly slightly higher level of Teachers’ stress compared to their counterparts, engaged in teaching at PG level (M.Tech).

**Table 10:** Correlation Matrix of the Psychopedagogical attributes

OBSERVATIONS (N=135)	Job Satisfaction	Professional Commitment	Teaching Interest	Individualism- Collectivism
Job Satisfaction	1.0000			
Professional Commitment	0.6639	1.0000		
Teaching Interest	0.3307	0.6026	1.0000	
Individualism-Collectivism	0.1810	0.4296	0.4664	1.0000

The correlation of the psychopedagogical attributes of the total sample (N=135) of the teachers reveals that:

1. There remains significantly high positive correlation between Job Satisfaction and Professional Commitment.
2. There remains significantly high positive correlation between Teaching Interest and Professional Commitment.
3. There remains positive correlation between Teaching Interest and Individualism-Collectivism , however the same is not significant.
4. There remains positive correlation between Professional Commitment and Individualism-Collectivism, however the same is not significant.
5. There remains just positive correlation between Job Satisfaction and Individualism-Collectivism however the same is not significant.
6. While finding correlation between Job Satisfaction, the group respondents’ exhibit significantly positive correlation between Professional Commitment and Teaching Interest.

**Table 11:** Teachers’ Stress (TS) based Juxtaposition in connection with Job Satisfaction

Groups under Comparison	Factor	N	Mean (M)	Standard Error	Standard Deviation (σ)	df	‘t’- value	P value	LoS (0.05 level)
Positively Stressed Group	Job Satisfaction	122	274.66	2.474	27.44	133	-1.482	0.1407	NS
Negatively Stressed Group		10	287.08	8.762	30.35				

In respect to impact of Teachers’ Stress over Job Satisfaction, Table 11 reveals that respondents belonging to positively stressed group do not differ significantly so much than its counter group as negatively stressed group in terms of Job Satisfaction as P value exceeds 0.05 at 5% level of significance.

**Table 12:** Teachers’ Stress (TS) based Juxtaposition in connection with Professional Commitment

Groups under Comparison	Factor	N	Mean (M)	Standard Error	Standard Deviation (σ)	df	‘t’- value	P value	LoS (0.05level)
Positively Stressed Group	Professional Commitment	122	134.52	1.40	15.55	133	2.517	0.0131	Significant
Negatively Stressed Group		10	122.91	3.30	11.45				

In respect to impact of Teachers’ Stress over Professional Commitment, it is apparent from the Table 12 that the respondents belonging to positively stressed group and negatively stressed group differ significantly in terms of their level of Professional Commitment as P value is less than 0.05 at 5 % level of significance in Engineering Education System.

Respondent belongs to Positively Stressed group possess higher level of Professional Commitment whereas respondents belong to negatively stressed group possess comparatively lower level of Professional Commitment.

**Table 13:** Teachers’ Stress (TS) based Juxtaposition in connection with Teaching Interest

Group under Comparison	Factor	N	Mean (M)	Standard Error	Standard Deviation ( $\sigma$ )	df	‘t’-value	P value	LoS (0.05 level)
Positively Stressed Group	Teaching Interest	122	102.80	0.96	10.65	133	3.68	0.0003	Significant
Negatively Stressed Group		10	91.33	1.28	4.43				

In connection with impact of Teachers’ Stress over Teaching Interest, as Table 13 reveals, that the respondents belonging to positively stressed group and negatively stressed group differ significantly in terms of their level of Teaching Interest as P value is less than 0.05 at 5 % level of significance in Engineering Education System.

Respondents belong to Positively Stressed group exhibit higher level of Teaching Interest in compare to respondent belong to negatively stressed group possess comparatively lower level of Teaching Interest.

**Table 14:** Teachers’ Stress (TS) based Juxtaposition in connection with Individualism-Collectivism

Group under Comparison	Factor	N	Mean (M)	Standard Error	Standard Deviation ( $\sigma$ )	df	‘t’-value	P value	LoS (0.05 level)
Positively Stressed Group	Individualism-Collectivism	122	70.58	0.70	7.77	133	2.03	0.0441	Significant
Negatively Stressed Group		10	65.91	1.49	5.17				

With respect to impact of Teachers’ Stress over Individualism-Collectivism, as the Table 14 denotes, that the respondents belonging to positively stressed group differs significantly in terms of their level of Individualism-Collectivism from the respondent group belongs to negatively stressed group as P value is less than 0.05 at 5 % level of significance. Respondents belonging to Positively Stressed group exhibit high collectivistic trait, compared to respondents belong to negatively stressed group and they possess comparatively lower level of collectivistic trait.

### 7. Discussion and Conclusion

According to first objective was framed to explore the level of stress of teachers and allied psychopedagogical attributes i.e. job Satisfaction, Professional Commitment, Teaching Interest, and Individualism-Collectivism of the teachers working in Engineering Education System. The results of the descriptive statistics-based analysis revealed that teacher are experiencing moderately lower amount of stress level which in turn elevate higher level of Job Satisfaction, Professional Commitment, moderately higher level of Teaching Interest and they exhibit moderately Collectivistic attitude towards collaborative work in their teaching profession. The data were analyzed through descriptive statistics which is given in Table 1, Figure 1 & 2 respectively.

As per second objectives was to compare the extent of Stress among the teachers working in Engineering Education System in terms of Gender (Male and Female), Teaching Experience (in terms of duration, viz., lower, middle, higher), level of teaching, i.e., P.G & U.G. The results of the ‘t’ test showed that there is no significant difference exhibit between respondent belonging to Male and Female at 5 % level of significance so far Teachers’ stress is concerned. Whereas Age group and span of teaching experience were identified as an important factor to have significant effect on reducing stress value in consonance with increase of time of age and teaching experience. In respect to comparative analysis based on

department, it is explored that UG (B.Tech.) level group respondent possess significantly higher level of stress in compare to its counterpart level from PG level (M.Tech.).

The third objective was to find out the internal correlation among the above spelt four psychopedagogical attributes of different level of teachers. The result of correlational analysis documented that teachers possess positive significant correlation between Job Satisfaction and Professional Commitment & Teaching Interest whereas there is also positive correlation exist between Professional Commitment and Teaching Interest as well as Individualism-Collectivism.

This finding supported by *Klassen et al. (2010)* as stated that cultural dimension of collectivism was significantly related to job satisfaction. *Demirok, M.S. (2017)* also partially supported the finding by giving the justification in his study that there is moderately positive correlation between career satisfaction as job satisfaction and professional commitment of special education teacher and also strongly supported by *Hegazy et al. (2017)*, *Wang et al. (2015)*, *cherabin et al. (2012)* about the positive significant relationship between job satisfaction and professional commitment.

The fourth objective was to find out the effect of Teacher's Stress over the selected psychopedagogical attributes in terms of Positively Stressed and Negatively Stressed group. The results of Juxtaposition based analysis in respect to factor as Teachers' Stress revealed that Teachers' stress does not have any significant impact over Job Satisfaction in regard to positively stress and negatively stressed group. In regard to Professional commitment and Teaching Interest, both stressed group differ significantly in their stress level is concerned. But Teachers' stress shape up the sociopsychological personality of teachers to work in Collectivistic perception-based teaching learning atmosphere

The finding is supported by the researcher *Wilson et al. (2012)* and *Baggerly et al. (2006)* stated in their study that stress was a negative predictor to have effect on professional commitment with negative correlational intensity of relationship but argued of *Babu, R. (2017)* stated that there is no significant relationship between occupational stress and teaching interest.

The study gives the clear connotation about the present scenario of teaching profession where stress is a burning issue which is always curbing down the productivity of teacher, increase absenteeism which in turn reduce Professional commitment, Job Satisfaction as well as Interest towards Teaching. But accordance with the framed objectives by the researcher, it gains to conceptualize that in present arena of engineering education system, teachers' stress value is comparatively low and they experiencing higher level of Job Satisfaction, Professional Commitment, Teaching Interest what is booming out after extensively analysis of the study.

As engineering education system is completely based on project work and hands on experiencing learning, so teachers are being developed to have belief in collectivistic trait toward their collaborative teaching learning which, will enhance the project work approach to teach students in laboratory, workshop-based hands on learning in respect to skill development of psychomotor domain.

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