

HOW TEACHING EXPERIENCE INFLUENCE PROFESSIONAL STRESS AND ALLIED PSYCHOPEDAGOGICAL STATUS OF THE FEMALE ENGINEERING-EDUCATORS?

(A study on techno-pedagogic fabric in India, with special reference to distance education)

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Present study attempts to explore the level and interrelationship of these psychopedagogical attributes as apparent among the female teachers of engineering colleges and universities, teaching through ODCL, from selected states of eastern-India. Attempt was also made to explore the impact of *span of experience in teaching* of the female teachers over these psychoeducational-attributes. Sample for the study includes 132 female engineering college teachers, drawn following stratified-random-sampling-technique. The study explores the level of female engineering college teachers with reference to the specified attributes, their interrelationship and impact of age over those attributes.

Key Words: ODCL, Engineering Education, Psychopedagogical-attributes, Professional-stress, professional-interest, job-satisfaction, collectivism.

1.0. Introduction

Engineering Education in Indian context is yet to be defined (Roy, et. al., 2005). As apparent, the terminology 'Technical Education' is more a phenomenon of imposition over the past-colonial nations by UNO through its sister concern, UNIVOC¹. However, for convenience, it may be assume that 'Engineering Education' is the activity of teaching engineering and technology, at school, college and/or university levels (see http://en.wikipedia.org/wiki/Engineering_education).

The generalized goal of engineering education irrespective of levels and national boundaries is to prepare people to practice engineering as profession and also to spread technological literacy, increase student's interest in technical vis-a-vis technological careers through science and mathematical education, accompanied with hands-on-learning. Engineering education often begins with technology-education in schools and is continued at college and university (Banerjee and Muley, 2007). As like performing arts, it is more akin to 'psychomotor domain' of learning apart from cognitive and affective domain. Engineering-Education forms a sub-domain within the formal system of education, which basically thrives to develop specified sets of skill apart from knowledge. This makes the system distinct (Tilak, 2001). Engineering education in the globalized perspective undergoing metamorphic changes in changing paradigms. In the context, as a developing nation, India has an opportunity to share the experience of the advanced nations and thereby, through juxtaposition, can adopt appropriate policies

for strengthening the existing system of engineering education, best suits for national situations. In consonance, good many universities now-a-day are offering engineering education through their off-campus open, distance and contact learning [ODCL] centers since last six years.

The arena of engineering education has been, since independence, a subject of scrutiny. Changes brought about various government and industry based inquiries and studies into engineering education have often proved to be too little and often inappropriate. In many ways studies into engineering education have resulted in producing many educational benchmarks and yet not addressing issues of dissatisfaction with engineering teachers' psychopedagogical attributes (Roy & Paira, 2008).

Issues of professional engineering education are not unique and many of these are found in the education of other professions (Aulich, 1990). It seems to be the nature of the best of professional education as a whole since pedagogy of professions and epistemology of professions are generally multidisciplinary in nature and, among professions, the engineering profession is the most 'multidisciplinary' of all (Zussman, 1985).

Distance education is becoming an effective way of acquiring knowledge and also an alternative to face-to-face instruction in many parts of the globe. Despite the growth in the size and acceptance of distance education, there have been persistent criticisms of this form of educational

delivery, because it often fails to provide for instruction among students and between students and tutors (*Galib Ahsan, et. al.*).

It was predicted in recent past that, '...distance learning will become more and more popular among the students, and a craze may be observed to be enrolled in the well-known universities imparting education through distance education' (*Roy, et. al., 2004*).

To minimize the shortcoming of distance education with special reference to engineering education, where development of (hard and soft) skill is a major objective of education, contact phase is accorded (and emphasized) with open and distance learning and thereby contributing a especial form of ODCL, referred as open, distance and contact learning, abbreviated as ODCL.

The increase of women engineers' participation in 'teaching of engineering' as profession changes the traditional understanding of engineering education since considerable span of last decade. In India, the available data refers that only 2.3% of female students are enrolling in engineering courses at graduation level, representing no more than 4.7% of total engineering students, suggesting the existence of the largest gender imbalance of all the university degree level. However, a sizable percentage among those, who are passing with postgraduate and doctoral degrees, opting for teaching instead of engineering as profession².

The present exponential rate of change in society has drastically lowered *predictability* and increased *uncertainties*. It is to be agreed that social change contributes a cultural lag between technological development and social change³. It will be accepted by almost each and every hand that future is neither an extrapolation of the present and nor of the past. Under these circumstances, *avoiding mistakes* is as important as *being innovative*. 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 a 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 present era, with Materials Science and Engineering qualifying as the underpinning technology (*Banerjee and Muley, op. cit.*).

Recognition and strategic role that engineering profession play in the economy and public welfare, has ensured that the profession and its formation has been subject of public scrutiny (*Beder, 1989*). In the globalized culture, to be more frank, in the present One-World-Culture, which is a resultant of Liberalization-Privatization-Globalization (LPG),

Engineering-Education in a 'developing nation' can't (and should not) be left in isolation. However here also domination is prominent from the 'so-called' bourgeoisies counters. In USA, Professor Richard Morrow (1994), the past chairman of the National Academy of Engineering in the United States referring to the strategic value of engineering professions to US national economic and social welfare, commented, *the nation with the best engineering talent is in possession of the core ingredient of comparative economic and industrial advantage*. One is to note here that engineering education in United States possess a grand contribution through 'brain-gain' policy⁴.

Irrespective of levels and types of education, teachers play a pivotal role in the process of implementation of the policies, formulated to achieve the desired goal in the qualitative improvement of education.

In educational scenario, teachers act as a 'pivot' on which the entire process of education rests on. In fact the quality and psychological makeup of the teacher possess tremendous impact over the process of teaching, which spreads among the 'level of acquisition of knowledge and skill' of the student too.

Effectiveness and performance of the teachers depend upon a sequel of factors and variables, some of which can be grouped under psychopedagogical attributes.

2.0. Defining the Key attributes

The key attributes, on which the present study hinges on, are: **professional-stress, professional-interest, job-satisfaction and individualism-collectivism**. Together, these psychopedagogical attributes in a bunch, forming the bases of psychopedagogical status of the sample group of respondents for the present investigation. Impact of **span of teaching experience** is explored to meet the stated objectives of the study.

2.1. Professional Stress

The word 'stress' is defined by the Oxford Dictionary as 'a state of affair involving demand on physical or mental energy'. A condition or circumstance (not always adverse), 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*). This demand on mind-body occurs when it tries to cope with incessant changes in life. A 'stress' condition seems 'relative' in nature. Extreme stress conditions, psychologists say, are detrimental to human health but in moderation stress is normal and, in many cases, proves useful. Stress, nonetheless, is synonymous with negative conditions. Today, with the rapid diversification of human activity, we come face to face with

numerous causes of stress and the symptoms of anxiety and depression.

Stress at work is a relatively new phenomenon of modern lifestyles. The nature of work has gone through drastic changes over the last century and it is still changing at whirlwind speed. They have touched almost all professions, and teachers are not the exceptions. Professional stress appears as a chronic disease caused by conditions in the workplace that negatively affect an individual's performance and/or overall wellbeing of her body and mind (Kelly, 1951).

Women among the teachers may suffer from mental and physical stress at workplaces, apart from the common professional stress. Sexual harassment in workplace has been a major source of worry for women, since long, which may not be a rare occasion. "Women may suffer from tremendous stress such as 'hostile work environment harassment', which is defined in legal terms as 'offensive or intimidating behavior in the workplace'. This can consist of unwelcome verbal or physical conduct. These can be a constant source of tension for women in job sectors. Also, subtle discriminations at workplaces, family pressure and societal demands add to these stress factors" (see <http://www.lifepositive.com/mind/psychology/stress/stress-workplace.asp>).

So far only few studies are reported by the scholars in India centering round the stress of the teachers and allied groups. Some such studies were conducted by Kailasalingam (1995), Bhatt (1997), Kudav (2000), Rao, K, et. al. (2000), Singh (2003), Bandhu (2008), Saroj Bala (2008), Dholakia (2009), Kavita Kumari(2009), Siva Sankar (2009), Siddiqui (2009), Mohore (2009), Sayi (2009) and Bala (2009).

However the present investigation consider 'professional stress' as the preliminary form of burnout and post status of eustress, caused due to professional overload and tensions among the teachers, engaged in engineering education and working in ODCL mode.

2.2. Professional Interest

Interest, according to Vernon (1967), is just a complex like an amalgam of subjective feelings and objective behaviour – the tendencies, which vary in intensity and from object to object. It has close relationship with culture and effort. As the important component of psychoeducational attributes, interest is an established set of dispositions, resulting from experience and it determines resulting behaviour. In this sense, interest is a tendency to behaviour, oriented towards creation objects, activities or experience which tendency varies in intensity and generally from individual to individual. Factor analytical studies of interest have shown about fifteen independent dimensions. Some of those dimensions are technology, music, art, politics, economics, etc.

While Vernon suggests that it is difficult to specify certain fixed number of dimensions of

interest, according to Mc.Dougall(1908), interest may be reflected to the motivating force that compels us to attend a person, a thing or any given activity; or it may be the effective experience that has been stimulated by the activity itself. In other words, interest can be the cause of an activity and the result of participation in the activity.

According to the Penguin Dictionary of Psychology, the term 'interest' is employed in the following two senses.

– *The functional interest*: It designates a type of feeling, earned by experience, which might be called 'worthwhileness' – and associated with attention to an object or course of action.

– *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 'worthwhileness' in connection with certain objects or matters relating to a particular subject or a particular field of knowledge(Reber, et. al., 2004).

Professional interest indicates the feeling of an individual or a group towards the very profession in which (s)he / they is/ are absorbed. Studies in western countries reveal close association of professional interest with working condition, respect, status, salary, age, habitation, gender and similar other psychosocial and socioeconomic factors. However, a close look over the dissertation abstracts makes it clear that not even a single study has yet been taken up in India incorporating sample group of teachers serving in engineering education system in India.

The present investigation used the term 'professional interest' so as to find out the tendency of women engineering teachers, teaching through ODCL, towards their profession (i.e., teaching)- that is, whether they feel any urge towards their profession – which may be positive or negative.

Until and unless a person is having strong positive interest towards her profession, it is difficult for the individual to do well in profession. Therefore, as in other professions, it is essential for the teachers to enhance the level of interest towards their profession i.e., teaching (Roy & Paira, 2009). In the changing socioeconomic fabric, it is often observed that joining the teaching profession, especially for a section of the technocrats, after completion of their course of study becomes a compulsion. In other words, an individual, in some cases, opt for certain profession merely out of some socioeconomic compulsion. In such cases, it is for the individual, who joined in profession primarily due to certain compulsion, to decide whether s/he will try to enhance professional interest of self or not.

Some studies are also available on teachers' professional interest (Shakuntala and Sabapathy, 1999; Roy, et. al. 2005; Roy, 2007)

2.3. 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, *op.cit*).

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

ODCL-based engineering education system, by virtue of its nature, differs to some extent from rest of the segments of education in terms of its emphasis and affinity towards psychomotor domain. It is not merely the individual-effort, but rather group-effort, which is much more essential, both for the teachers and taught, especially when some group-project is taken up. In most of the cases, group-projects require an integrated group-approach.

Project, in engineering education, is defined as a purposeful wholehearted activity completed in cooperation in educational setup. As engineering education depends much on imbibing manipulative, drawing and observational skill, therefore team-effort is an important consideration in engineering education, even when offered through ODCL mode. It is often quoted that success of engineering education hinges on 'learning by doing' principle. In this very spectrum, most of the practical works and laboratory activities need collective effort; and at times, nature of skill needs (and therefore is planned) to be transmitted among the students also demanding collective effort.

It is an age-old axiom that in educational setup, teacher is viewed as a role model for the students. Personal qualities of the teacher often disseminates among the students. As such, the importance of collectivism among the teachers is a truly supportive factor in the process of acquiring skill. If the students are taught by the teachers, having a higher level of collective attribute, students, as it is expected, will also be influenced by the very characteristic of the teacher.

2.4. Job-Satisfaction

Job satisfaction is in regard to one's feelings or state-of-mind regarding the nature of their work. Job satisfaction can be influenced by a variety of factors, such as the quality of one's relationship with their colleagues or supervisor, the quality of the physical environment in which they work, degree of fulfillment in their work, and so on. It may have resultant impact with professional stress or interest.

However, there is no strong acceptance among researchers, academicians or consultants that increased job-satisfaction produces improved

job-performance. In fact, improved job-satisfaction can sometimes decrease job-performance. For example, one could let sometime sit around all day and do nothing. That may make them more satisfied with their 'work' in the short run, but their performance certainly didn't improve.

Sense of inner-fulfillment and pride achieved when somebody is performing a particular job. Job-satisfaction occurs when a teacher feels he has accomplished something having importance and value worthy of recognition and of sense of joy. As per dictionary meaning, Job-satisfaction is an act of satisfying, fulfillment, or gratification. It may be the state of being satisfied; contentment or the cause or means of being satisfied or may be confident acceptance of something as satisfactory, dependable, or true.

This factor was dealt by studies conducted by scholars like Dixit (1993), Reddy and Babu (1995), Panda (2001), Vyas (2002), Pushpam (2003), Amudha and Velayudhan (2003), and Bala (2009).

For the sake of the present investigation, the terminology is considered as the Sense of inner fulfillment and pride achieved when female teachers, involved in teaching engineering subjects through ODCL..

Within the engineering education spectrum, apart from the three important psychopedagogical attributes, viz., professional stress, professional interest and collectivism of a teacher, the level of job-satisfaction also matters a lot to find the success of the system, as reflected through the outputs of the system. Now-a-days it is often argued that engineers of the day need to have in their possession, the most important skill, i.e., the soft skill, which includes the entire attitudinal domain of the personality, interaction pattern and expression of feelings towards situation – all of which possess a close relationship with the social adjustment and success in the profession.

However, a close look over the dissertation abstracts makes it clear that not even a single study has yet been taken up neither in India, nor in abroad, incorporating all the above factors. It is also interesting to note that none of the studies referred in this section has addressed the psychopedagogical attributes of teachers, teaching in distance education system. With a view to exploring the real situation, the present study was taken up.

2.5. Experience group

The sample of the present investigation was classified in three broad categories, based on their **span of teaching experience**. It is worthnoting in this context that the group of sample, as is assumed, in the other area of teaching of subject usually exhibits a higher degree of positive correlation between age and span of experience. However a peculiarity was visible among the group of sample, where the degree of correlation, due to

the reason that a handful proportion of the respondents started their career in industry and latter shifted on teaching. Hence, irrespective of having a comparatively higher age, such respondents are classified, not in higher experience group. Only the span of experience in teaching profession was considered in the process of classifying this group of respondents. Due to this reason, the experience groups include respondents from a varied span of age range. The groups considered under the study are as follows:

2.5.1. Lower experience group

The group of respondents falling in the experience span includes seventy-five female engineering college teachers. The respondents, possessing less than five years of teaching experience, irrespective of their age are considered under this category.

2.5.2. Middle experience group

The group of respondents falling in the experience group includes forty-four female engineering college teachers. The respondents falling under the experience category includes respondents having teaching experience in the concerned cadre, ranging from minimum of five years in the lower end and maximum of fifteen years in the upper end.

2.5.3. Higher experience group

The group of respondents falling in the experience span includes thirteen female engineering college teachers. The minimum span of experience considered under the category is more than fifteen years. Maximum service length of the category though not specified however appears 29 years.

3.0. Objectives of the study

Underlining objectives of the present investigation were to:

3.1. Explore the level of professional stress, professional interest, collectivism and job satisfaction of the female teachers working in engineering college/universities and are offering instruction through ODCL.

3.2. Explore the interrelationship of above-spelt four psychopedagogical attributes of the respondents.

3.3. Explore the impact of span of teaching experience over the stated psychopedagogical attributes.

4.0. Methodology of the study

Methodology adopted to carry out the project was as follows:

4.1. Sample

The sample for the present investigation incorporates one hundred and thirty two (132) female

member of faculties from six different engineering subject-trade, teaching in twenty-four off-campus centers of technical universities, having centers in eastern India.

A stratified random sampling technique was adopted to deduce the sample for the present investigation

The peculiarity of the sample for the present investigation is in terms of their affiliation towards subject-discipline, gender and mode of teaching.

4.2. Tools

To explore the psychopedagogical attributes of the respondents, four sets of standardized scales, developed by the investigators, were used, which include a Professional Stress Scale(PSS) for engineering teachers, Professional Interest Scale(PIS) for engineering teachers, an Individualism-Collectivism Scale(ICS) and a Job-Satisfaction Scale(JSS).

4.2.1. Professional Stress Scale

To ascertain the level of professional stress of the respondents, the PSS was administered over the respondents. The scale was developed in a questioning cum statement pattern, including twenty-four items, with a scale range of 0 to 60 and a midpoint of 30. The reliability coefficient of the scale was determined as 0.76.

4.2.2. Professional Interest Scale

PIS used for the study incorporates thirty (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 a scale mid point of 90. The scale bears a reliability coefficient of 0.84.

4.2.3. Individualism-Collectivism Scale

With a view to measuring individuality-collectivity attribute of the respondents, the ICS was administered. The scale was a seven point Likert's scale, incorporating sixteen items with proportionate positive and negative ratio, placed haphazardly on the scale. Scale range varied from 16 to 112, with a midpoint of 64 and a reliability coefficient 0.86.

4.2.4. Job satisfaction Scale

To ascertain the level of Job satisfaction of the respondents, the JSS was administered over the respondents. The scale was a five point Likert's scale, including twenty items, distributed proportionately, placed haphazardly in statement form. The scale possesses a scale range 0 to 100 and a midpoint of 50. Reliability coefficient of the scale was determined as 0.92.

4.3. Data

Data were collected from the respondents by administering the scales. By nature, collected data were quantitative; and were analyzed through

descriptive statistics, correlation and 't' test. For the purpose of analyzing data, different statistical symbols were used, which are introduced as follows:

- y** indicates standard deviation of a set of data
- N** indicates the number of individuals in a given group
- D** indicates differences of two mean scores under comparison
- y_D**, also termed as standard error of differences between two means under comparison. The value is calculated following square root of sum of two

sets of square values of standard deviation of a given set of data, further divided by the respective N

- df** refers to degree of freedom to deduce confidence level
- LoS** refers to level of Significance
- t** refers to the ratio of D & y_D

5.0. Findings

Findings of the present investigation are listed as follows:

5.1. Total group

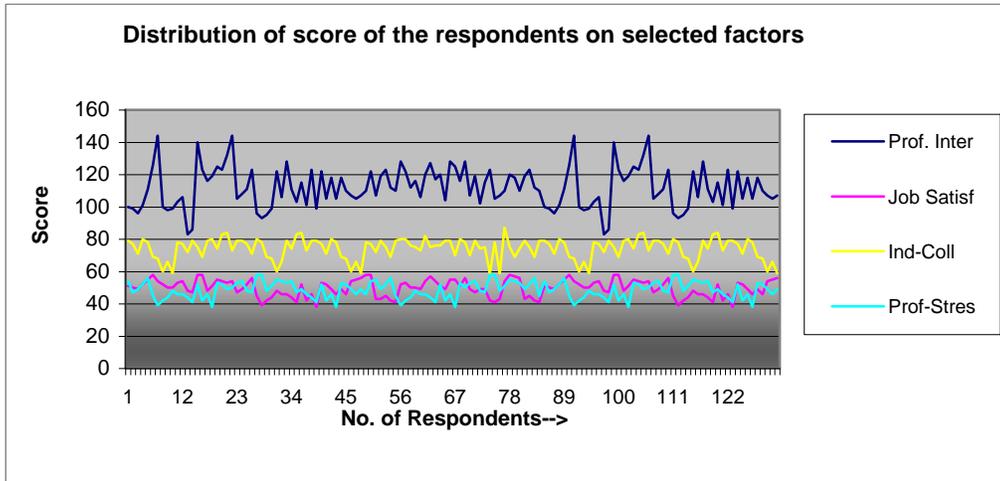


Fig.1. Distribution of the score of the respondents [Total group, N=132]

Table1. Observation over the total group in terms of M & y

Total Women	N=132	Professional Stress	Professional Interest	Job Satisfaction	Individualism-Collectivism
	M	48.58	112.045	49.727	47.0984
	y	5.1499	12.7152	5.134	6.4914

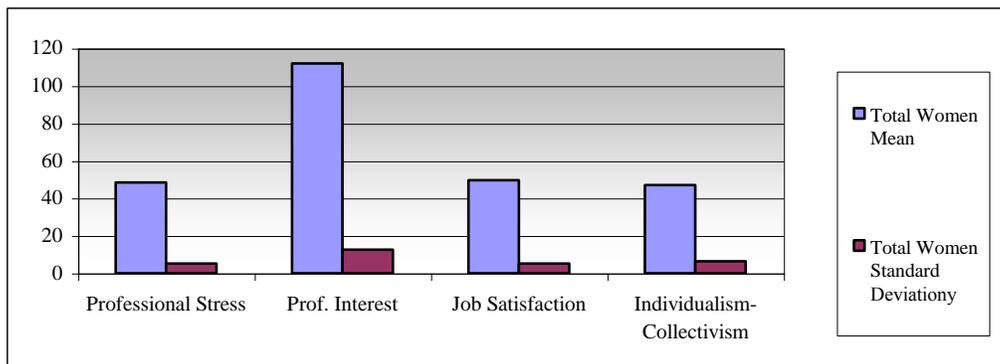


Fig.2. Distribution of mean (M) and standard deviation (y) of the psychopedagogical attributes [Total group, N=132]

Analysis of data over the total group of respondents [N=132] reveals that:

5.1.1. So far the level of Professional stress is concerned, the group of respondents possess a moderately higher level of Professional interest [M=48.5833, $y = 5.1499$] in the professional stress scale.

5.1.2. In terms of professional interest, the group of respondents possesses moderately higher degree of professional interest [M=112.045, $y = 12.7152$, Midpoint = 90] in the professional interest scale.

5.1.3. Keeping in view the Job-satisfaction of the respondents it may be reported that the group of respondents possesses almost a neutral degree of Job-satisfaction [M=49.727, $y = 5.134$, Midpoint =50] in the job-satisfaction scale.

5.1.4. So far the Individualism-collectivism is concerned, the group of respondents exhibits individualistic trait [M=47.0984, $y = 6.4914$, Midpoint = 50] over the Individualism-collectivism scale.

Table 2. Correlation Matrix of the Psychopedagogical attributes

N=132	Professional Interest	Job Satisfaction	Individualism-Collectivism	Professional Stress
Professional Interest	1.00	0.448873	0.094749	0.005694
Job Satisfaction		1.00	-0.07384	-0.16112
Individualism-Collectivism			1.00	-0.0096
Professional Stress				1.00

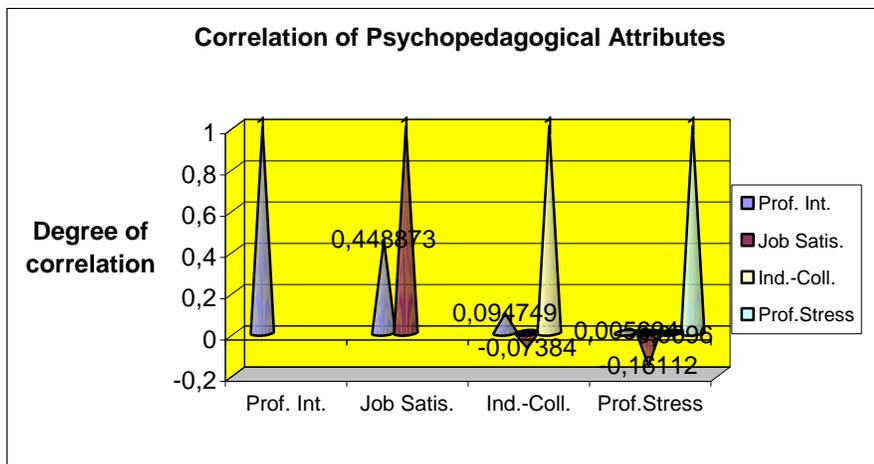


Fig.3. Internal Correlation coefficient of the psychopedagogical attributes [Total group, N=132]

The correlation of the psychopedagogical attributes of the female teachers reveals that:

5.1.5. While finding correlation with professional interest, the group exhibits significantly positive correlation with job satisfaction as also with individualism.

5.1.6. The group exhibits positive but insignificant correlation between Professional Interest and Professional Stress.

5.1.7. While finding correlation with job satisfaction, the group exhibits negative and

insignificant correlation with individualism as also with professional stress.

5.1.8. The group exhibits negatively insignificant correlation between individualism and professional stress.

5.2. Teaching-Experience (TE) based Juxtaposition in connection with Professional Interest

5.2.1. Table 3 reveals that the respondents belonging to lower and middle experience group differs significantly in terms of their level of professional interest. Respondents belonging to

lower experience group possess significantly higher level of professional interest compared to

their counterparts belonging to middle experience group.

Table 3. Lower Vs. Middle experience group

Groups under Comparison	Factor	N	Mean	σ	D	σ_D	df	t	LoS
Lower experience group	Professional Interest	75	118.2133	10.7187	14.2133	1.8882117	117	7.5273866	Significant at 0.01 LoC
Middle experience group		44	104	9.459					

5.2.2. It is apparent from Table 4 that the respondents belonging to lower and higher experience group differ significantly so far their level of professional interest is concerned. Respondents belonging to lower experience group

possess significantly higher level of professional interest compared to their counterparts belonging to higher experience group and the difference is significant at 0.01 level of confidence.

Table 4. Lower Vs. Higher experience group

Groups under Comparison	Factor	N	Mean	σ	D	σ_D	df	t	LoS
Lower experience group	Professional Interest	75	118.2133	10.7187	15.9826	3.3913795	86	4.7127	Significant at 0.01 LoC
Higher experience group		13	102.2307	11.3844					

5.2.3. In contrast with the above two findings, table 5 reveals that the respondents belonging to middle and higher experience group do not differ so far their level of professional interest is concerned. Respondents belonging to middle

experience group possess marginally higher level of professional interest compared to their counterparts belonging to higher-experience group and the difference is not significant at any standard level.

Table 5. Middle Vs. Higher experience group

Groups under Comparison	Factor	N	Mean	σ	D	σ_D	df	t	LoS
Middle experience group	Professional Interest	44	104	9.459	1.7696	3.464542	55	0.0510777	NS
Higher experience group		13	102.2307	11.3844					

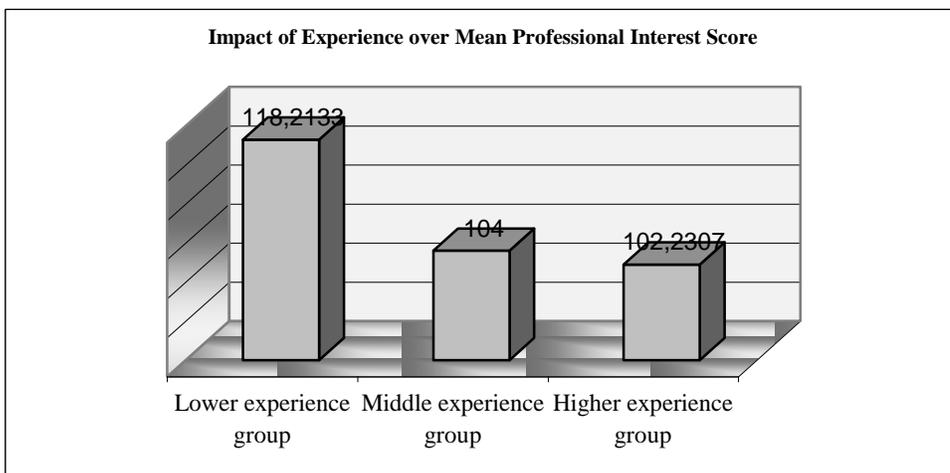


Fig.4. Mean Professional Interest score in differing experience group [Total group, N=132]

5.2.4. From the above three findings, as well as from the Fig. 4, it may be apparent that span of teaching experience of the female teachers (engaged in engineering education through ODCL) possess significant impact over their level of professional interest. The study observed that 5.2.5. without identifying intervening factors.

interest towards profession of the respondents reduces in consonance with enhanced span of experience. This may be due to intervening factors, may be socio-biological or the like, however no specific conclusion could be derived on in this context

5.3. Teaching-Experience (TE) based Juxtaposition in connection with Professional Stress

Table 6. Lower Vs. Middle experience group

Groups under Comparison	Factor	N	Mean	σ	D	σ_D	df	t	Lo S
Lower experience group	Professional Stress	75	48.2133	5.1337	0.9696	0.9924587	117	0.976967	NS
Middle experience group		44	49.1162	5.2799					

5.3.1. Table 6 reveals that thought respondents from middle experience group possess comparatively higher degree of professional stress,

however they don't differ significantly from the respondents belonging to lower experience group.

Table 7. Lower Vs. Older age group

Groups under Comparison	Factor	N	Mean	σ	D	σ_D	df	t	Lo S
Lower experience group	Professional Stress	75	48.2133	5.1337	1.0943	1.405519	86	0.77857	NS
Higher experience group		13	49.3076	4.5949					

5.3.2. Table 7 reveals that thought respondents from higher experience group possess comparatively higher degree of professional stress, however they don't differ

significantly from the respondents belonging to lower experience group, so far their level of professional stress is concerned.

Table 8. Middle Vs. Older age group

Groups under Comparison	Factor	N	Mean	σ	D	σ_D	df	t	Lo S
Middle experience group	Professional Stress	44	49.1162	5.2799	0.1914	2.257661	55	0.084778	NS
Higher experience group		13	49.3076	4.5949					

5.3.3. Table 8 reveals that respondents from Higher experience group possess marginally higher degree of professional stress, than the respondents belonging to Middle experience group, so far their level of professional stress is concerned. However this difference is not significant at any level.

stress of the respondents; however as is depicted from fig. 5, the professional stress enhances in consonance with the span of teaching experience; the rate of enhancement of stress is quite speedy when the respondents, belonging to lower experience group, are proceeding towards middle experience group; though the trend continues, however rate of enhancement of stress reduces, in situations, when the respondents proceeds from middle experience group to higher experience group

5.3.4. So far the preceding three findings are concerned, it may be assumed that span of experience in teaching do not possess any 'significant' impact over the level of professional

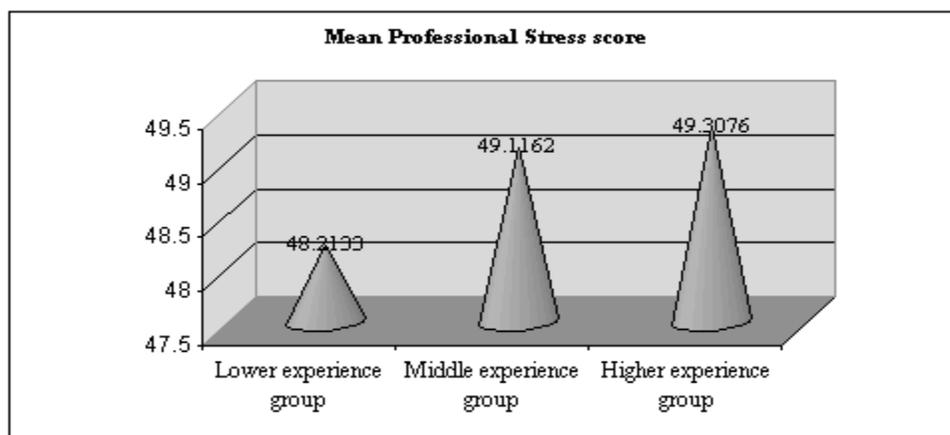


Fig.5. Mean Professional stress score in differing experience group [Total group, N=132]

5.3.5. The finding as apparent in the Fig. 5 helps deduce the idea that stress follow a 'cumulative enhancement curve' among the respondents in terms of their span of teaching experience and for the respondents, belonging to lower-experience

group, it is lowest. Possibly the respondents belonging to lower age group are much stress-absorbent, compared to their counter experience groups.

5.4. Teaching-Experience (TE) based Juxtaposition in connection with Job Satisfaction

Table 9. Lower Vs. Middle experience group

Groups under Comparison	Factor	N	Mean	σ	D	σ_D	df	t	LoS
Lower experience group	Job Satisfaction	75	51.1333	4.279	3.5287	9.2933332	117	0.3797023	NS
Middle experience group		44	47.6046	5.8431					

5.4.1.

Table 9 reveals that respondents from lower experience group possess comparatively higher degree of job-satisfaction, and this difference is

not significant at any standard level, if compared with the respondents belonging to middle experience group.

Table 10. Lower Vs. Higher experience group

Groups under Comparison	Factor	N	Mean	σ	D	σ_D	df	t	LoS
Lower experience group	Job Satisfaction	75	51.1333	4.279	2.2103	14.797764	86	0.1493671	NS
Higher experience group		13	48.923	4.729					

5.5.2.

Table 10 reveals that respondents from lower experience group possess comparatively higher degree of job-satisfaction, compared to the

respondents belonging to higher experience group; however this difference is not significant at any standard level.

Table 11. Middle Vs. Older age group

Groups under Comparison	Factor	N	Mean	σ	D	σ_D	df	t	LoS
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Middle experience group	Job Satisfaction	44	47.6046	5.8431	1.3184	15.349814	55	0.08589029	NS
Higher experience group		13	48.923	4.729					

5.5.3.

Table 11 reveals that respondents from higher experience group possess marginally higher degree of job-satisfaction, compared to the respondents belonging to middle experience group, however the difference is not significant at any standard level.

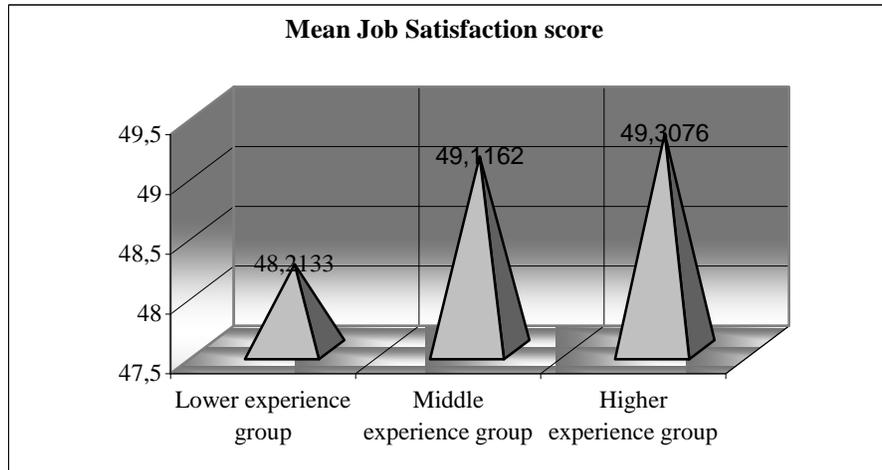


Fig.6. Mean Job Satisfaction score in differing age group [Total group, N=132]

5.5.5. As apparent from the Fig.6, span of teaching experience of the teachers possess significant impact over their level of job satisfaction too and it varies inversely with enhanced age, as the study observes.

5.6. Teaching-Experience (TE) based Juxtaposition in connection with Individualism-Collectivism

Table 12. Lower Vs. Middle experience group

Groups under Comparison	Factor	N	Mean	σ	D	σ_D	df	t	LoS
Lower experience group	Individualism Collectivism	75	74.0533	6.1199	0.0629	14.069975	117	0.044705	NS
Middle experience group		44	74.1162	7.4408					

5.6.1. Table 12 reveals that respondents from middle experience group possess marginally higher degree of collectivistic trait, if compared with the respondents belonging to middle experience group, so far their status in individualism-collectivism trait scale is concerned. However this difference is not significant in any standard level.

Table 13. Lower Vs. Higher experience group

Groups under Comparison	Factor	N	Mean	σ	D	σ_D	df	t	LoS
Lower experience group	Individualism Collectivism	75	74.0533	6.1199	0.1303	23.34954	86	0.0055804	NS
Higher experience group		13	73.923	6.1858					

5.6.2. Table 13 reveals that respondents from lower experience group possess marginally higher degree of collectivistic trait, if compared with the respondents belonging to higher experience group, so far their level of

collectivism is concerned in individualism-collectivism trait scale. However the trait difference of the two groups under comparison is not at all significant at any standard level.

Table 14. Middle Vs. Higher experience group

Groups under Comparison	Factor	N	Mean	σ	D	σ_D	df	t	LoS
Middle experience group	Individualism Collectivism	44	74.1162	7.4408	0.1932	23.3495248	55	0.008274	NS
Higher experience group		13	73.923	6.1858					

5.6.3.

Table 14 reveals that respondents from middle experience group possess marginally higher degree of collectivistic trait, if compared with the respondents belonging to higher experience level.

group, so far their level of collectivism is concerned. However this difference is not significant at any standard

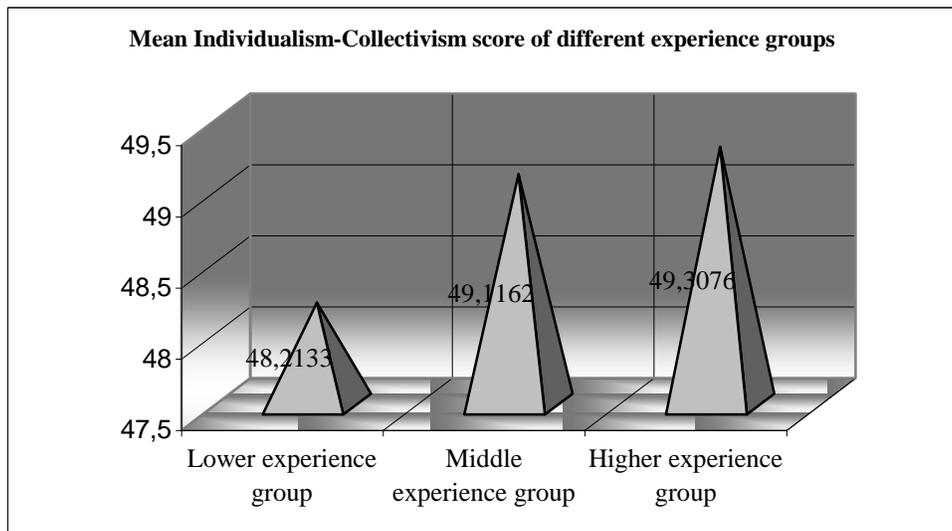


Fig.7. Mean Individualism-Collectivism score in differing age group [Total group, N=132]

5.2.15. Figure 7 reveals that respondents from lower experience group possess comparatively higher degree of individualistic trait, if compared with the respondents belonging to middle and higher experience group, so far their level of individualism-collectivism trait is concerned. However this difference is not significant at any standard level.

It is apparent from the findings of the study that span of experience (in teaching) of the respondents possesses impact over the major psychopedagogical attributes. Among those, level of professional interest is significantly influenced by span of experience; however span of experience do not possess 'significant' impact over the level of professional stress, job-satisfaction and collectivistic traits of the respondents.

6.0. Discussion and Conclusion

Respondents belonging to lower experience group require special mention as they exhibits

individualistic trait much than the collectivistic trait, compared to the senior experience groups. The group also lacking on professional-stress and job-satisfaction, however they possesses more professional interest. The study predicts possibility of allied intervening factors, possibly socio-biological, having impact over age and thereby over their psychopedagogical attributes, as considered in the study.

Irrespective of having a moderate size of sample, the uniqueness of the present study stands with its sample group. Criteria considered for selection of sample includes the engineering teachers, engaged in teaching through ODCL system and that too, from marginalized gender group in engineering education, i.e., the female teachers. Probably this is the first attempt to explore the psychopedagogical status profile of the female engineering educators, engaged in imparting education through ODCL mode (which is a recent phenomenon in Indian academia), with special focus over the four major components of psychopedagogic status, possessing direct bearing with education and teacher effectiveness. Therefore the findings of the study would be quite helpful to the future

researchers, to initiate future researches in teacher-education in ODCL, with special focus on engineering-education and gender-studies too. It is also expected that such studies would enhance the effectiveness and efficacy of ODL system and thereby help achieve the nation the desired development, as engineering education possess a direct bearing with socioeconomic development of a given nation (Goss, 1969; Haq, 1975; Ahlstrom, 1982; Mazumder, 1998; Jakobeit, 1999; Sen, 2000; Roy, et. al, 2008).

Notes

The concept of Technical Education is not beyond debate, though the apex body is named after Technical Education, i.e., AICTE, instead of Engineering Education.

1. A glance review of the present scenario reveals the fact.

2. Social change is a less accelerated phenomenon compared to technological advancement.

3. The policy through which the developed nations attract the outstanding brains from developed nations and harness them for their own (national) development. As a result, the developing nations face the problem of 'brain-drain'.

REFERENCES

1. Ahlstrom, G. (1982). *Engineers and Industrial Growth*, London: Groom Helm.
2. Aiken, L.R. (1984). *Psychological Testing and Assessment* (4th Ed). Boston: Allyn & Bacon.
3. Amudha Devi and Velayudhan, A. (2003). Job satisfaction of working lecturers working in private and government colleges. *Indian Journal of applied Psychology*, 40(1), 25-28.
4. Aulich, Sen. T.G. (Chair), (1990). *Priorities for Reform in Higher Education, Report of the Senate Standing Committee on Employment, Education and Training*, Canberra: Australian Government Publishing Service.
5. Bala, Baskar, K. (2009). *Job satisfaction, mental health and occupational stress of special educators working in special schools for mentally handicapped, retarded, hearing handicapped, visually handicapped and physically handicapped: A comparative study*. Unpublished doctoral thesis in Psychology. Hyderabad: Osmania University.
6. Bandhu, Tarlok (2008). *A study of burnout among college teachers in Punjab in relation to organizational role stress and institutional climate*. Unpublished doctoral thesis. Shimla: Himachal Pradesh University.
7. Banerjee, Rangan and Muley, Vinayak, P. (2007). *Engineering Education in India*, Draft Final Report. Bombay: IIT.
8. Beder, S. (1989). Towards a More Representative Engineering Education. *International Journal of Applied Engineering Education*, 5(2), 173-182.
9. Bhatt, D.(1997). Job stress, job involvement and job satisfaction of teachers: A correlational study. *Indian Journal of Psychometry and Education*, 28(2), 87-94;
10. Colman, Andrew M. (2007 imprint) *Penguin Dictionary of Psychology* (2nd Indian edition), New Delhi: Oxford University Press.
11. Dholakia, A.M. (2009). *A study of mental health and occupational stress of married working women*. Unpublished doctoral thesis Patan: Hemchandracharya North Gujarat University.
12. Dixit, Meera (1993). Effect of sex variable on different factors of job satisfaction among primary teachers. *Indian Journal of Psychology and Education*, 24(1), 11-15.
13. Galib Ahsan, Q.M., Hossain, J.M and Saha, N.K. (2006). A survey of students' characteristics of MBA programme: Case of Bangladesh Open University. *Indian Journal of Open Learning*, 15(3), 237-246.
14. Goldman, L.S. (1991). 'The Social Captivity of Engineering', in Durbin, T.P. (ed.) *Critical Perspectives on Non-academic Science and Engineering*, (pp. 121-145), Betlehem: Lehigh University Press.

15. Goldman, L.S. (2004). Why do we need a philosophy of engineering: a work in progress. *Interdisciplinary Science Reviews*, 29 (2), 163-176.
16. Goss, E. (1969). Change in technological and scientific developments and its impact upon the occupational structure, in Perrucci, R., and Gerstl, J. (eds.) *The Engineers and the Social System*, New York: John Wiley and Sons.
17. Haq, M. S. (1975). *Education and Development Strategy in South and South East Asia*. Honolulu: East-west Centre.
18. http://en.wikipedia.org/wiki/Engineering_education
19. <http://www.lifepositive.com/mind/psychology/stress/stress-workplace.asp>
20. India, Government of. (2007). *Selected Educational Statistics*. Ministry of Human Resource Development, New Delhi: Department of Education, Planning, Monitoring and Statistical Division.
21. India, Government of. (2008). *Selected Educational Statistics*, MHRD, New Delhi: Department of Planning, monitoring and Statistics division.
22. Jakobeit, Cord. (1999). The World Bank and Human Development. *Development and Cooperation*, 6, 4-5.
23. Kailasalingam, H.M. (1995). An investigation into the interaction effect of some factors on burnout among teacher educators in Karnataka, Ph.D. thesis . Dharwad: Karnataka University.
24. Kavita Kumari (2009). *Occupational stress and marital adjustment of executives and non-executives employees of BCCCL*. Unpublished doctoral thesis. Hazaribag: Vinoba Bhave University.
25. Kelly, G.(1951). *The Psychology of personal Contacts*. New York: Norton.
26. Kudav, Pramila (2000). Professional aspects and teacher burnout-A relationship, *University News*, 38(7), 13-17.
27. Maslow, A.H. (1968). *Towards a psychology of being*. New York: Van Nostrand.
28. Mazumder, T. (1998). Economics of Indian Education: The Emerging Policy, and Finance. *Asian Development Review*, 15(2), 86-130.
29. McDougall, W. (1908). *An Introduction to Social Psychology*. London: Methuen.
30. Mohore, B.K. (2009). *A comparative study of job stress, job satisfaction and adjustment among teachers of junior college and secondary schools of Chandrapur district*. Unpublished doctoral thesis in Education. Nagpur: RTM Nagpur University.
31. Panda, B.B. (2001). Attitude towards teaching profession and job satisfaction of college teachers of Assam and Orissa: A comparative study. *Indian educational Review*, 37(1), 73-83.
32. Pushpam, A.M.L. (2003). Attitude towards teaching profession and job satisfaction of women teachers in Coimbatore. *Journal of Educational Research and Extension*, 40(2), 49-58.
33. Rao, K., Moudud, S. and Subbakrishna, D.K. (2000). Appraisal of stress coping behaviour in college students. *Journal of Indian Academy of Applied Psychology*, 26(1-2), 5-13.
34. Reber, Emily, Reber, Arther S. and Rhianon, Allen (2004). *The Penguin Dictionary of Psychology* (Paperback, 3rd Edition) New York: Penguin
35. Reddy, A.V. and Babu, R.M.V. (1995). Job satisfaction of teachers working in residential and non-residential schools. *Journal of Indian Education*, XXI(1), 53-63.
36. Richards, J. (1992). *Poor Image Prevails. Professional Engineering*. January 9, Southampton: Mechanical Engineering Publications.
37. Roy, R. (2007). *Ethnopedagogy-Education of the Tribes, Teachers' Training and juxtaposition of status*. New Delhi: Shipra Publications.
38. Roy, R. and Paira, A. (2008). Redefining Education @ Hermeneutics of social development, technology and teacher. *Journal of Technical and Vocational Education* 25(1&2), 80-99.
39. Roy, R. and Paira, A. (2009a). Hermeneutics of education, teacher-education and development in Indian social fabric. *University News*, 47(26), 16-25.
40. Roy, R. and Paira, A. (2009b). Gender intervention: Factors influencing participation of tribes in higher education. Cited in *Women, Education and Development: Perspectives, Issues and Concerns*; (pp. 64-75), New Delhi: Shipra Publications.
41. Roy, R., Chakraborty, S.K. and Mandal, N.K. (2004). Education, Technology and Development: An approach. *Indian Science Cruiser*, 18(4), 36-44.
42. Roy, R., Mandal, S. and Mandal, N.K. (2005). Gender, in relation to selected psychoeducational attributes among the technical teachers. *Journal of Technical and Vocational Education*, 22(1), 7-13.
43. Roy, R., Mandal, S.N., Chattopadhyay, S. and Mandal, N.K. (2006). Attitude of the Working Engineers towards Distance Mode of Instruction. *Indian Journal of Open Learning*; 15 (3), 225-235.
44. Saroj Bala (2008). *Coronary heart disease in relation to certain aspects of personality, stress and coping styles*. Unpublished doctoral thesis . Kurukshetra: Kurukshetra University.
45. Sayi, L.N. (2009). *An investigation into the relationship between burnoutness and work orientation among women teachers*. Unpublished doctoral thesis. Visakhapatnam: Andhra University.
46. Sen, Amartya. (2000). *Development as Freedom*. New Delhi: Oxford University Press.

47. *Shakuntala, K.S. and Sabapathy, Tara* (1999). Teacher adjustment as related to interest in attitude towards teaching. *Psycho-Lingua*, 29(2), 133-136.
48. *Siddiqui, Ismat Jahan* (2009). *A study of stress, causes and use of coping strategies among the university administrators*. Unpublished doctoral thesis. New Delhi: Jamia Millia Islamia.
49. *Singh, H.* (2003). A comparative study of stress among male and female teachers in relation to their personality needs and adjustment, Ph.D. thesis, Merut: CCS University.
50. *Siva Sankar, V.* (2009). *Stress and coping strategies in middle age*. Unpublished doctoral thesis in Psychology, Tirupati: Sri Venkateswara University.
51. *Tilak, J.B.G.* (2001). Education and Development. *Indian Social Science Review*, 3 (2), 219-266.
52. *Vernon, P.E.* (1967). *Personality Tests and Assessments* (Rev. Ed.). London: Methuen.
53. *Vyas, M.V.*(2002). The job Satisfaction of primary school teachers with reference to sex, marital status and educational qualification, Doctoral Ph.D. Thesis, Saurashtra: Saurashtra University.
54. *Zussman, R.* (1985). *Mechanics of the Middle Class: Work and Politics among American Engineers*, Berkely: University of California Press.

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