An empirical study of social support, stress and life satisfaction among engineering graduates: mediating role of perceived work/study life balance

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Abstract: Escalating stress, depression and suicidal attempts in universities have led to the increased importance of research into the impact of perceived stress, support, work-life balance and life satisfaction amongst engineering graduates. This study is an initiative to assess the dimensions of work-life balance among university graduates and finding its impact on their overall life satisfaction. Additionally, this study investigates the joint effects of social support and stress on the work-life balance and the likely mediating effect of work-life balance on support-satisfaction relationship using structural equation modelling approach. A self-report questionnaire was administered to collect primary data from 232 final year engineering students. Findings indicate a significant positive relationship between variables like social support, work-life balance and life satisfaction while stress has a negative impact on work-life balance and life satisfaction among students. However, the relationship between social support and life satisfaction is partially mediated by work-life balance of graduates. Limitations of this research and the implications to both work-life balance literature and engineering graduates are discussed in accordance with the findings.

Keywords: social support; stress; life satisfaction; work-life balance; engineering; student; college student; education; quality of life; graduates; structural equation modelling; school-life balance.


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1 Introduction

A student dons many a hat: partner, son, friend, classmate, etc. Most of the times these roles are in conflict and a student feels difficulty in managing and prioritising his/her work/family demands. Balancing academics, physical and mental health, room partners, hobbies, finances, social ties, etc., in a totally new and different environment is a tremendous change for students who may be coming from a place where most of their basic needs were taken care of (Ceyhan, 2006). The academic rigor of today places a lot of demands on the engineering students, the majority of whom are striving to manage their time juggling many things like studying course material, meeting assignment/project deadlines, and participating in the university extracurricular activities (Macan et al., 1990). Specifically, zeroing-in on the final year as the year of reckoning calls for a significant stress due to increased pressure of academics and exam (Shaikh et al., 2004) and getting best paying job and securing high social status (Isralowitz and Ong, 1990; Ho and Yip, 2003). As a result, the students are under pressure to score high grades, fulfil parent’s ambition and meet the personal and social expectations and are therefore hypersensitive to the feedback from their teachers and family members (Ang and Huan, 2006).

To put things into perspective, there is a large body of literature eliciting information about problems and challenges faced by first year college students such as depression, anxiety, searching for new social support, making decisions, isolation, academic pressure, etc. associated with life adjustments (Reischl and Hirsch, 1989; MacLennan and Dies, 1992; Feldman, 2005), managing the transition (Steltenpohl and Shipton, 1986) improving learning skills and the ability (Kuh et al., 1991; Hattie et al., 1996; Leamnson, 1999), increasing retention (Astin, 1975; Beal and Noel et al., 1980), etc. Yet, despite the range of literatures that exist, very few have emanated from emerging/developing countries with emphasis on engineering students. Talib and Zia-ur-Rehman (2012) reported higher level of stress among engineering students than management science students. At the outset, a report published (The Telegraph, 2014) on quality of students’ life discussed the influence of factors like living costs, employment hope, salary on graduation, students’ satisfaction with social life and mental health on students’ life at universities. Moreover, the ignominy of not performing to potential, the rising cases of suicides, depression and anxiety in engineering institutions during final year highlights the need for assessment and study of widespread dissatisfaction with the quality of work/life among students. The phenomenon is not confined only to the lower rung of institutes. In India, the crème-de-la-crème of the engineering ilk, the stellar IITs have also reported rising stress and depression level among students due to intense academic and
parents-peer pressure (Headlines Today Bureau, 2011). As a reflection of the work of Kuh et al. (2005), information acquired through the data ascertaining that a mere one-half of all students admitted to the four year degree course in the colleges of the US complete their degrees successfully. Circumstantial evidence in form of lack of social support, psycho-social stresses and depression, are well entrenched causes of suicides whereas time management (Macan et al., 1990), lack of finances (Bang, 2009) invokes the increase in stress levels.

2 Literature review

2.1 Social support and stress among students

Social support denotes the existence or availability of people on whom one can rely and people who let us know that they care about value and love. In the context of the students’ perspective, their inclination lends towards mainly two types of support, i.e., support from their institute and social support (Martinez et al., 2013). Parents, peers and teachers play the main protagonist as far as extending social support to students is concerned. To that end, the social support extended by the family has the bearings of emotional as well as physical support. Overt in their outlook, social networks along with other social bonds manifest as rich sources of social support (Lee et al., 1999). Students encounter a myriad of stresses while studying at an engineering college. Most times they manage the situations deftly on their own but in some other cases they long for advice and support. They look up to family, friends, faculty and other staff members for additional support. Social support in this study is categorised mainly as: support from family, support from friends and support from significant others.

From school to university, the transition carries an element of adjustment. Students stumble upon situations that are in stark contrast to which they faced at school. Problems like accommodation, scholarship, health issues, social relationship, homesickness creates significant stress for someone who is on a learning spree as far as university life is concerned (Ceyhan and Ceyhan, 2011). Schneider (2007) identified the important stressors among engineering graduates. They are: heavy workload, competition, the rigor of the curriculum and lack of sleep. Waghachavare et al. (2013) pointed to the importance of other observed predictors for the development of stress; a case in point being predictors like gender, academic factors, environmental and social factors.

Gayle and Lowe (2017) outlined the influencing role of coping ability in achieving work/study life balance of students. In the backdrop of the aforesaid, the present study assessed students for general distress and their coping ability.

2.2 Work/study-life balance of students

Students are faced with an arduous task of juggling coursework, academics and obligations from teacher and the family, thus, experience greater difficulties in striking a balance. The term balance describes the situation where an individual is satisfied with the equilibrium between the various roles in his or her life (Drago, 2007). The term work-life here represents the kind of relationship between students’ coursework and personal life activities which will differ for each individual. Ensuring work-life balance requires sincere efforts at both levels: individual as well as organisation. Until students are treated
with respect and offered genuine and commensurate reward for participating in placements, there will be no safe, work/life balance for them (Victoria, 2016). Pookaiyaudom (2015) opined that awareness and agreeability w.r.t. the necessity of work-life balance among students will go a long way in establishing the credentials as far as the value of their life is concerned, thus also ensuring the optimality and valued life of students. To capture the same in extant literature, Doble and Supriya (2010) stressed upon the continued importance of work/study-life balance and developed a 54-item scale. Concerted in his approach, Austin (2002) is vocal in his observation that a loss of balance among students may result in a host of issues like health hazards, poor interpersonal relationship etc. To facilitate the proceedings of the study, we have classified work-life balance of students as: academics, health and leisure and campus facilities and support.

2.3 Life satisfaction of students

In the words of Pavot and Diener, (1993), life satisfaction is a cognitive component of subjective well-being. Another qualification of how well the students’ life is given by the quality of life (Sirgy et al., 2007) which is the satisfaction in its entirety that a student feels at college/university. Koivumaa-Honkanen et al. (2001) held the view that life dissatisfaction comes with a detrimental risk of suicide in the longer run. Studies explicitly point out that the more the students have self-oriented perfectionism (Hasnain and Fatima, 2012) bonding, flexibility, and support from family, the higher the student’s satisfaction with their lives while depression, anxiety and stress had a negative impact on life satisfaction of university students (Kumar et al., 2016). Of noteworthy mention is a further analysis that reveals depression was present 25%, anxiety 32% and stresses 20%. Dogan and Celik (2014) came up with a unique global judgment approach for assessing life satisfaction. Alternatively, it can be expressed as one en capturing specific aspects of life i.e., self, family, friends, college, and the living environment. In consonance with the above study, life satisfaction in the paper has been divided as: satisfaction with family and friends, satisfaction with college and hostel facilities and self-satisfaction.

This study is an attempt to enhance the body of literature regarding the role of the impact of perceived stress and perceived social support in determining work/study-life balance of final year engineering students. First question remains as to whether the aforesaid (perceived stress and perceived social support) accounts for variation in work life balance? On a related note, the study tries to identify the indirect relationship between work life balance and life satisfaction of students. Taking the above research questions as a cue and also the extant literature review, following conceptual model is proposed (Figure 1).

Figure 1  Hypothesised model
The following hypotheses have been developed:

H1A Students’ perceived social support will be positively related to their work life balance.

H1B Students’ perceived social support will be positively related to their overall life satisfaction.

H2 Students’ work life balance will be positively related to their life satisfaction.

H3 Students’ perceived stress will be negatively related to their work life balance.

H4 Work life balance mediates the relationship between perceived social support and life satisfaction.

3 Methods

3.1 Participants and procedure

This empirical study in its original form is required to test a hypothetical framework design suited to engineering graduates. Data were collected in the spring of 2016 using written questionnaires. To be nearer to the realms of reality, questionnaires were distributed to approximately 300 final year engineering students in a large private university in India. Subsequent elimination of cases with incomplete and missing data rounded off to a total of 232 completed questionnaires which amounted to a response rate of 77.33%.

All of the participants were hostlers. The respondents’ were from the age group of 19 to 22 years, with an average age of 20 years. The gender breakup of the sample of 232 respondents was 83% boys and 17% girls. The questionnaires were distributed inside the classes through a voluntary participation by the class representatives. The researcher on her part read out the directions and was up for any queries that sufficed. As such there was no room for doubts. Participation was voluntary and all the participants were assured of their anonymity. No identifying information beyond demographic data was requested.

3.2 Measures

The first part of the questionnaire dealt with demographic variables (e.g., gender, age, etc.). Second part comprises 37 items, organised as different scales to measure other four variables, i.e., stress, social support, work/study-life balance and life satisfaction of the students. The instruments were pilot tested on 85 students in order to assess the reliability of the constructs.

Perceived social support was assessed using 12-item ‘multidimensional scale of perceived social support’, developed by Zimet et al. (1988). Each item (e.g., ‘there is a special person with whom I can share my joys and sorrows’) was measured on a seven point Likert scale from very strongly disagree to very strongly agree. Responses to the seven items were averaged to form a perceived social support score ($D = 0.93$).

Perceived stress was assessed with 10 items adopted from the short form version of 14-item ‘perceived stress scale’ developed by Cohen et al. (1983). Each item (e.g., “In the last month, how often have you felt nervous and stressed?”) is rated on a five point
Likert scale from never to very often. Responses were averaged to produce a perceived stress score ($\alpha = 0.84$).

Work-life balance was assessed using ten items (e.g., “I feel tired or depressed because of studies”). It comprised of various dimensions of the work/life/study balance discussed by Gayle and Lowe (2007) for higher education students. Responses to the ten items were assessed on a five-point scale from never to always, were averaged to form a total score ($\alpha = 0.72$).

The overall perception of life satisfaction, the dependent variable, was measured using the parallel set of five items of brief multidimensional students’ life satisfaction scale (the word college substituted for school) that has been previously used in the literature by Seligson et al. (2003). Each item (e.g., ‘I would describe my satisfaction with my college experience as’) was measured on seven-point Likert scale from terrible to delighted. Responses were averaged to produce a life satisfaction score ($\alpha = 0.84$).

3.3 Data analysis

Data were analysed using SPSS 20 and AMOS 23. Data analysis was executed in two steps. The first three hypotheses were tested using correlation analyses. The fourth hypothesis was tested using structural equation modelling to assess the relationship between social support, perceived stress, work/study-life balance, and life satisfaction.

Later, research conceptual models were studied through structural equation models and maximum likelihood estimation.

4 Results

Table 1 presents the means, standard deviations and Chronbach’s alpha of the study variables.

<table>
<thead>
<tr>
<th>Construct</th>
<th>Measure</th>
<th>Mean</th>
<th>S.D.</th>
<th>Chronbach’s alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social support</td>
<td>Family support</td>
<td>5.53</td>
<td>1.40</td>
<td>0.93</td>
</tr>
<tr>
<td></td>
<td>Friends support</td>
<td>5.0</td>
<td>1.45</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Support from significant others</td>
<td>4.90</td>
<td>1.54</td>
<td></td>
</tr>
<tr>
<td>Stress</td>
<td>General distress</td>
<td>2.95</td>
<td>1.111</td>
<td>0.87</td>
</tr>
<tr>
<td></td>
<td>Coping behaviour</td>
<td>2.93</td>
<td>.29</td>
<td></td>
</tr>
<tr>
<td>Work/study life balance</td>
<td>Academics</td>
<td>3.39</td>
<td>.89</td>
<td>0.72</td>
</tr>
<tr>
<td></td>
<td>Health and leisure activities</td>
<td>3.52</td>
<td>.93</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Campus facilities</td>
<td>3.30</td>
<td>1.04</td>
<td></td>
</tr>
<tr>
<td>Overall life satisfaction</td>
<td>Family/friend</td>
<td>5.38</td>
<td>1.52</td>
<td>0.84</td>
</tr>
<tr>
<td></td>
<td>College/university</td>
<td>4.35</td>
<td>1.49</td>
<td></td>
</tr>
</tbody>
</table>
Table 2 presents the correlations for the study variables.

Table 2 Pearson correlation matrix, mean and standard deviation

<table>
<thead>
<tr>
<th>Source</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 WLB</td>
<td>.348**</td>
<td>.348**</td>
<td>-.188**</td>
<td>3.42</td>
<td>.73</td>
<td></td>
</tr>
<tr>
<td>2 LifeSat</td>
<td>.348**</td>
<td>.675**</td>
<td>-.260**</td>
<td>4.89</td>
<td>1.30</td>
<td></td>
</tr>
<tr>
<td>3 SoSup</td>
<td>.348**</td>
<td>.675**</td>
<td>1</td>
<td>5.14</td>
<td>1.29</td>
<td></td>
</tr>
<tr>
<td>4 Stress</td>
<td>-.188**</td>
<td>-.260**</td>
<td>-.187**</td>
<td>2.95</td>
<td>.69</td>
<td></td>
</tr>
</tbody>
</table>

Notes: WLB = work life balance, LifeSat = overall life satisfaction, SoSup = social support. **p < .01, *p < .05 level (two-tailed).

Work-life balance was negatively related \( r = -.188, p < .01 \) with perceived stress. Similarly, social support \( r = -.187, p < .01 \) and life satisfaction \( r = -.260, p < .01 \) relate negatively to perceived stress. Overall life satisfaction \( r = .675, p < .01 \) and work life balance \( r = .348, p < .01 \) related positively to perceived social support.

Figure 2 presents the results of structural equation modelling. The intermediary role of work life balance between perceived social support and overall life satisfaction was analysed using SEM. The results of the SEM which used AMOS data-fitting program supported the hypothesised relationships. The maximum likelihood estimation of the model yielded significant results showing that a test of the structural model led to good fit indices and the hypothesised model fits the data well \( \chi^2 = 2.355, df = 1, \) RMSEA = .077, NFI = .987, CFI = .992, GFI = .995). The results indicated a significant direct path between perceived social support and students’ overall life satisfaction. Following causal links could be noticed:

1. perceived social support positively related to work life balance and life satisfaction
2. stress negatively related to perceived social support and work life balance
3. work life balance positively related to overall life satisfaction
In summary, the findings showed support for Hypotheses 1 and 2 where there is a positive relationship between work-life balance and overall life satisfaction with perceived social support. However, we found little/no support for Hypothesis 3 as perceived stress was not strongly related with work life balance of students. Finally, to test Hypothesis 4, bootstrap method (Preacher and Hayes, 2004) was used. The result specifies that work-life balance partially mediates the relationship between Social support and life satisfaction of students.

5 Discussion

In light of mounting perceived stress, depression and anxiety among engineering students in Indian universities (Kumar and Bhukar, 2013), there is a marked void in the sense that only a handful of studies have examined the students' ability to balance school-work and personal life and its impact on their overall life satisfaction. There are scarce amount of studies emanating from India, which showcases depression, distress and coping behaviours among students of such professional courses; most of such studies have all been a foreign proposition so to say (Naveen et al., 2015). Taking a long hard view of numerous studies which have investigated relationship between stress and social support (Baqutayan, 2011), stress and work-life balance (Loshbaugh et al., 2006), stress and life satisfaction (Alleyne et al., 2010), social support and work-life balance (Gayle and Lowe, 2007) and social support and life satisfaction (Coffman and Gilligan, 2002; Zhang et al., 2014; Ahmed et al., 2010), this study is an earnest attempt to provide a holistic approach by including all the aforesaid variables in one proposed theoretical model and then investigate whether high likelihood of perceiving academic pressure stress and career threat stress would predict decreased levels of work-life balance. Mindful of the fact that the relationship between social support, work-life balance and life satisfaction is so well evidenced in the general population, this causal relationship was also investigated with this sample of engineering students, based on Wang et al. (2011) model of social support, work-family enrichment and life satisfaction. Structural equation modelling was used to show causal relationship and mediation effect among all the variables included in the study.

The present study aims at contributing richly to the extant literature in two ways. First, it aims to examine the combined effect of stress and social support on work/study life balance of engineering students. Second, it examines the mediating role of work/study life balance between social support and life satisfaction of engineering students of India. To that end, the study manifests itself as a panoramic view of the work/study life balance of engineering students.

In general we – deeply ensconced in the work/study life balance of engineering students – found that social support is positively related to work/study life balance and life satisfaction and work/study life balance partially mediates the social support-life satisfaction relationship. Our concerted efforts materialised in form of the finding that the direct effects of social support and work/study life balance on life satisfaction were consistent with previous studies (Wang et al., 2011). The said results are in sync with the previous study (Peng et al., 2006) which suggests that university facilities, course content
and support from faculties are the key factors in determining students’ satisfaction with their life. Further, the results are also congruent with some other relevant studies (Coffman and Gilligan, 2002; Zhang et al., 2014; Ahmed et al., 2010; Bailey and Miller, 1998), which indicate students receiving the highest level of social support rate their life as more satisfactory.

However, in stark contrast to the work of previous study (Martinez et al., 2013), we found that there is no/little association between stress and work/study-life balance of university students. A plausible reason might be that these students are at the cusp of graduating and subsequently stepping into the world of work. Thus, they are likely to believe that studying long hours would help them earn good grades, which in turn will raise their chances of grabbing good job. Adeyemo (2007) opined that for a student to graduate with good grade, he/she has to read his/her books with understanding, and that will take more time to accomplish. Following this, Kunal (2008) made an incisive analysis that students who are very successful in their desired career have longer study time. Thus, most of the early career adults demonstrate commitment in terms of hours spent in study and work. In the same vein, we would like to add that little/no association could be noticed between stress and social support too which runs contradictory to that of Hamdan-Mansour and Dawani (2008) while it supports the findings of Berrios et al. (2016) which says social support was not a significant predictor of stress levels. The possible reason why no/little effects were found could be that the interpersonal resources (the family and friends) are not completely responsive to the specific needs elicited by the stressful situation (Joseph et al., 1997). Social support can only be of help when it conforms to the coping strategies that are most adequate in the stressful situation (Cohen and Wills, 1985). Also, instead of socialising, some students may like to spend more time in other recreational activities like sports, music and arts, meditation, etc. which help in better adoption of coping skills, improved knowledge of stress and enhanced ability to resolve conflicts (Shapiro and Schwartz, 2000).

Surrounded by a myriad of problems, a college student’s life is very critical as they are under the scanner all the time. Constant pressure of academics, getting good jobs and later on the pressure of supporting their family takes a heavy toll of them, and they are expected to be the elites in the society. As per a poll discussed in previous study (David, 2009), college students face a much higher level of stress than any other people who are at different stages of their lives and tend to experience depression sometime during their four years at college. 72% of students in India are unaware of how to deal with stress and its ill-effects. In 2006 alone, 5,857 students committed suicide owing to exam stress (Kumar and Bhukar, 2013). The samples included in this study were found to be moderately satisfied with their life. The influential factors appeared to be the quality of support they received from their families, faculties, colleagues, etc.

5.1 Implications

At a time when there is a pronounced paucity of studies in the context of engineering students’ work/study life balance and overall satisfaction with their lives, our results provide food for thought for subsequent researchers using different samples to validate findings of this study. The findings of the present study have several implications.

At ground zero, the results of such studies can be passed on to students through orientation programs, student newsletters, on the web portal, or in the classroom. These findings would increase their awareness of the utmost significance of the fact that if
students are lacking in even one of these areas (i.e., social support, stress, work/study-life balance and life satisfaction), their performances will be significantly lower. Once students have a better understanding of how stress and social support influences their academic/work performance, they may be more likely to understand their own situations and take corrective action.

Nowadays, recruiting, retaining the students and helping them to achieve their goals is an important issue for institutes of higher education. Thus, these findings can give valuable input to educators, teaching / non-teaching college staffs and parents themselves to help student achieve balance in their personal and professional lives. A sensitive learning and assessment system should be established with more focus on students’ overall development. The present result also suggests that if students’ social relations are strong and supportive, they feel more satisfied with their lives. Thus, focus should be given on more team-based assignments/projects, participation in extracurricular activities, outings like industrial tour, sports meet or picnic which would help students to get socialised with others and make formal or informal groups. Further, work/study life balance is an important factor to have a satisfactory life. To that end, the onus lies on the educators to consider students as dynamic beings, requiring a balance among academics, career advancement, and personal life and design interventions to promote physical, mental and spiritual well-being of students. Although all of our respondents were unmarried adults, but it is quite common in collectivism culture that unmarried children have to bear the responsibility of looking after their parents as well as grandparents (Kung, 2001; Jones, 1995). In light of above, it becomes imperative that work becomes an essential tool to support one’s family and students are constantly motivated to earn good grades and job. On the flip side, however there is also an inherent pressure for these individuals to do well in terms of their family responsibilities. Hence, one could argue that increasing balance in terms of the work/study and family roles of employees will have positive impacts on the life satisfaction of not just the students but also their families.

6 Conclusions

India – being the largest producer of engineers – has flattered to deceive in churning out employable graduates of the engineering ilk. PTI (2016) in its report reveals that over 80% of engineering graduates are unemployable in India. The employers lament the fact that the quality of engineers continue to be awful (Bloom and Saeki, 2010), thus increasing unemployability significantly (Sebastian, 2013). This situation causes stress and anxiety among engineering students about earning top pay, handling challenging job profiles or working for a prestigious organisation. Students often prioritise academics at the expense of personal factors, including relationships, physical and mental fitness. This can have a detrimental effect as far as *their academic performance is concerned because general health and well-being are a precursor to academic brilliance. In the context of engineering students, a lack of balance can become overwhelming if healthy living and wellness does not factor into the overall equation. Graduate students today are as concerned about the overall quality of their lives as they are about their grades in coursework (Stratton et al., 2006). To exhibit positive balance students must be well versed with the knowhow of managing leisure time (Wang et al., 2011). Also, educators,
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faculty members, and support staff can play an instrumental role in limiting isolation and enhancing involvement among students, thus fostering appropriate work/study-life balance (Brus, 2006). They can also help students in aligning their academic goals with personal growth in order to facilitate better quality of life (Stratton et al., 2006).

7 Limitations and future research

The study comes with its own set of limitations which require further probing and supplementary research. Unprecedented as it is, nevertheless this study has focused only on final year students from engineering courses. Thus, the study may not be a true representative of the phenomenon for other students of medical, law, etc. In addition, further studies comparing students from public and private universities, male students vs. female students etc. are required for more rigorous result. Also the fact that the sample of this study was collected in one city/university hinders the generalisability to other cities/universities, particularly in light of cultural differences in managing work-family issues related to social support, stress and life satisfaction. Finally, for all the talk about the research being pristine in approach, a word of caution though – the study is based on a small sample from one university and the data is self-reported. However, the findings could go a long way in shaping a future program, as also helping to delve deeper into investigation across a clutter of information up for grabs.

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