

AN ANALYSIS ON A PUBLIC UNIVERSITY FINAL YEAR ENGINEERING STUDENTS' STRESS LEVELS

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ABSTRACT – Stress is one of the serious issues that affect university students' life and has been identified to cause academic decline, poor relationships with peers and family members and overall dissatisfaction with life. As for final year university students, academic workloads, expectations from societies and future career uncertainties are some of the common factors that create stress. Therefore, this case study aims to investigate the stress experienced by the final year engineering students at a public university. The main objectives are to identify factors that cause stress and its effects on the students. A five-dimension set of questionnaires i.e. Interpersonal, Intrapersonal, Motivation, Environment, and Workload was distributed to 260 final year students of an engineering faculty before they participated in a Stress Management Awareness Program. The program which was part of the Final Year Project (FYP), exposed the students with stress management strategies. Later, interviews were conducted to explore the extent of stress effects on the students' academic success, and lifestyle in general, and the effect of the workshop. The mean scores of the dimensions and its items were analysed descriptively and findings from the interviews were compared after the students had undergone the workshop. The quantitative results indicated a moderate level of stress among the students with some significance in 'Environment' and 'Workloads' dimensions. Qualitatively, the workshop had made the students aware of their stress experiences, and educated them with various stress management strategies. Interestingly, there were similar continuous patterns of stress experiences from 33 volunteered interviewees, which have brought to light the actual circumstances of students' stress. Evidently, these results call for a context-driven stress management module that can provide the students with resourceful self-regulated strategies in coping with the demanding life as final year engineering students.

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INTRODUCTION

Undergraduates undertaking professional programs such as engineering are subjected to high level of stress. These students are exposed to excessive stress that could lead to psychological issues (Waghachavare, et al. 2013) on their health and academic achievement. At the final year of engineering studies, where stress scores were significantly higher among older students (Shamsuddin et al. 2013), burgeoning academic workloads, expectation from societies, and future work-related uncertainties are some of the common challenges that create stress (Tangade et al., 2011; Beehr, 2014; Usha & Solomon, 2017). They have to train themselves for job markets which require proof of personalities, knowledge, and skills certifications to convince future employers of the courses learned throughout the four-to-five-year engineering program (Uehara et al. 2010; Elias, Ping, & Abdullah, 2011). Utmost, the peak of the challenges is when it comes to preparing the final year project (FYP). Simultaneously, this is the time when students are involved in personal relationships where there is a constant fear of separation or losing a relationship. To add, expectations from parents, and responsibilities towards family are among the common causes of stress among these students (Ramteke & Ansari, 2016).

The stress experienced by the final year engineering students therefore has a high probability to trigger serious issues that can lead to academic decline, poor relationships and overall dissatisfaction with life. Salam, et al. (2013) identify stress as an individual state as a result of the interaction with the environment, which is perceived as threatening or threat to the well-being. Note that, an individual in a stressful situation is influenced by his or her mental ability to carry out ongoing tasks (Yasin & Dzulkifli, 2011; Khodarahimi et al. 2012). This means stress is basically depended on emotions (Lazarus, 2000) which includes an individual's thoughts (mental) and physical experiences of discomfort or pleasure (Manz, 2003). Indeed, Roddenberry and Renk (2010), and Houghton et al. (2012) admit the link between student stress and illness. Stresses due to low self-esteem, borderline personality traits, substance abuse or behavioural addictions are some of the areas that require further investigation (Walburg, 2014).

Given the substantive seriousness of stress, effort needs to be systematized in assessing the students' stress so that appropriate stress management strategies can be exercised to help the students to cope with the matter. This leads to coping strategies which are defined as the person's constantly changing cognitive and behavioural efforts to manage external or internal demands that are appraised as taxing or exceeding the persons resources (Redhwan, et al. 2009). Previous research showed that students with an active coping style have lower levels of psychological distress (Chen, et al. 2009). Some of the strategies include counselling, workshops on stress and time management, and assertive training and communication skills (Kumaraswamy, 2013). In Islam, the Quran teaches human beings to face His trials through the verses 'Allah burdens not any soul beyond its capacity' (Quran 1: 287) and, 'Surely, the help of Allah is near' (Quran 1: 215). From these verses, a believer will accept trials amenably therefore, feel less stressful in handling the matter because it is understood that trials and tribulations in life either in form of calamities or blessings, is as a means to show obedience to the God.

Nonetheless, few studies have looked into the stress experienced by the final year undergraduate engineering students in the Malaysian context. Hence, this study attempts to assess the stress level experienced by the final year engineering students at the Faculty of Manufacturing Engineering (FME), Universiti Malaysia Pahang. The aim is to answer the following questions:

1. What is the stress level of the FME final year engineering students?
2. What are the dimensions or factors associated with students' stress?
3. What are the stress management strategies commonly used by the students?

METHOD

To begin with, a survey was conducted on 260 final year FME engineering students at a public university. The students were required to respond using a five-Likert scale questionnaire (from strongly disagree to strongly agree) in assessing their stress levels. The questionnaire has two sections i.e. respondents' demographic information; and 20 items which were categorized under five (5) dimensions. Each of the five dimensions i.e. Interpersonal, Intrapersonal, Motivation, Environment, and Workload has four (4) items respectively. The following coding was used to represent the dimensions and each item in the dimension.

Table 1. The coding for the dimension and items in the questionnaire

Dimension (DIM) & Item	Coding
DIM1 Interpersonal	A1, B1, C1, D1
DIM2 Intrapersonal	A2, B2, C2, D2
DIM3 Motivation	A3, B3, C3, D3
DIM4 Environment	A4, B4, C4, D4
DIM5 Workload	A5, B5, C5, D5

The questionnaire was previously utilised in other local university setting, hence some adjustments were made and piloted to check its validity and reliability. The instrument reliability was checked using internal consistency (Cronbach α) and the reliability coefficient is .881. Data were analysed in groups of three categories based on the five scales i.e. No stress (strongly agree and agree); Not sure; and Stress (strongly disagree and disagree) using SPSS frequencies (f) and percentages. Later, five students of the 260 respondents gave their consent to be interviewed to find out causes or impacts of stress and how they manage their stress. The interview questions consist of nine semi-structured questions and content analysis was carried out to analyse the data.

RESULTS AND DISCUSSION

Firstly, the data gathered using the survey are discussed in terms of items in each construct and between the constructs. The results from each item in the five dimensions showed a majority of 'No stress' category except from the three items (A4, B4 and C4) in the 'Environment' and an item (D5) from the 'Workload' dimension. Two of the items i.e. A4 (dislike about food prepared at the café), and D5 (inadequate time to complete tasks) were recorded as the factors that triggered stress among the students. The students were unsure in terms of item B4 (lack of lab equipment) and C4 (insufficient reading materials for FYP project requirements); nevertheless, it insinuated some form of dissatisfaction that calls for further investigation by the institution. As highlighted in the table, table 2 presents the three categories (no stress, unsure, and stress) itemized frequencies and percentages for each domain.

Table 2. Frequencies and percentages for each item in the dimensions

Dimensions	Items	Category								
		No Stress		Not Sure		Stress				
		<i>f</i>	%	<i>f</i>	%	<i>f</i>	%			
Interpersonal	A1	187	71.9	58.8	45	17.3	25.8	28	10.8	15.4
	B1	153	85.7		67	8.6		40	5.70	
	C1	223			22			15		
	D1	119	45.8		80	30.7		46	23.5	
Intrapersonal	A2	105	40.4		58	22.3		97	37.3	
	B2	217	83.5		29	11.1		14	5.4	
	C2	209	80.6		28	10.8		23	8.8	
	D2	123	47.4		77	29.6		60	23.0	
Motivation	A3	115	44.3	63.4	101	38.7	24.2	44	17.0	12.0
	B3	165	81.1		63	12.0		32	6.90	
	C3	211			31			18		
	D3	101	38.9		72	27.6		87	33.5	
Environment	A4	80	30.9		80	30.9		100	38.2	
	B4	65	25.0		139	53.5		56	21.5	
	C4	89	34.2		126	48.5		45	17.3	
	D4	159	61.2		59	22.6		42	16.2	
Workload	A5	96	37.0	50.7	71	27.5	31.5	93	35.5	17.8
	B5	132	41.5		82	30.4		46	28.1	
	C5	108			79			73		
	D5	56	21.5		55	21.2		149	57.3	

In assessing the students’ level of stress in accordance to the five dimensions, table 3 reveals ‘no stress’ in four of the five dimensions. However, ‘Workload’ (41%) was considered as a source of stress for most of the students (108/260), and 48 of them remained unsure. This means, apart from excessive works, shorter time span (D5) (Table 2), the students considered taxing final year classes (A5), uninteresting projects (B5), and demanding requirements from faculties (C5) contributed to their stress in the final year of engineering studies.

Table 3. Frequencies and percentages for each dimensions

Dimensions	Categories					
	No Stress		Not Sure		Stress	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Interpersonal	209	79.7	20	7.6	31	12.7
Intrapersonal	213	81.9	20	7.7	27	10.4
Motivation	195	74.4	26	9.9	39	15.7
Environment	135	52.3	47	17.9	78	29.8
Workload	104	40.4	48	18.3	108	41.3

From the 33 interview sessions, majority of the participants went through some form of stress in the process of completing their Final Year Project (FYP). Some claimed to fallen ill during the process and went through series of counselling sessions. Others revealed being in the state of confusion for a long period of time that had negative effect on their FYP progress. There was also stress in dealing with relationships as identified in the literature. Some participants were torn between FYP and close relationships with their loved ones. They felt the need to sacrifice their relationship in doing the FYP. As well, a few admitted experiencing low self-esteem, and fear of failure, causing them to cry non-stop for days. The stress caused them to get angry easily, became emotional and agitated even with the usual background noise like the sound of guitars and music surrounding them. Concurring with the study quantitative findings, the participants provided evidences how ‘Environment’ dimension could trigger stress condition. The quality of infrastructure and facilities provided by the faculty and institution like the Internet, labs, laundry services, food and transportation were the necessities that called for serious attention to the authority. For instance, inadequate facilities and poor lab maintenance at the faculty affected the smoothness of their FYP progress because they had to wait for their turn. This in turns, affected the issues related to the ‘Workload’ dimension as discussed earlier.

Similar stress management strategies were identified. They were aware of their lack of time management skills, hence, sought help from their supervisors to reschedule their Gantt-chart and work pace. They learnt about stress management from the seminar conducted by their faculty. They also sought advices from their parents and friends in uplifting their self-motivation, and became active in sports to handle stress. Most would resort to sleeping, listening to music and maintaining composure when facing stressful situations. The believers, on the other hand, relied on *salah*, praying and

reciting Quran. Finally, good rapport and frequent meetings with supervisors as initiated by the faculty helped to alleviate their stress.

CONCLUSION

This study supports the literature in this area which emphasized significantly on the needs for institutions to conduct its own assessment on its students' stress level. The importance of context has led this research to be conducted in assessing FME final year students' stress level at the institution. Though the students' vulnerability of stress level was moderate, yet, there were some deficiencies identified in the 'environment' and 'workload' dimensions as suggested by the both qualitative and quantitative findings, which had put the students in stress condition. Hence, an expansive and in-depth investigation is highly recommended to be conducted to other faculties and batches of students at the institution. Not only, it provides information on students' current state of psychological well-being and stress levels, the institution and faculty are furnished with substantial evidences on areas that require improvisations and improvements. Evidently, the results call for context-driven self-regulated stress management strategies to the students in coping with the demanding life as final year engineering students at a public university.

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REFERENCES

- Beehr, T. A. (2014). *Psychological Stress in the Workplace (Psychology Revivals)*. Routledge.
- Chen, H., Wong, Y., Ran, M. & Gilson, C. (2009). Stress among Shanghai University students. *Journal of Social Work*, 9(3), 323-344.
- Elias, H., Ping, W.S. & Abdullah, M.C. (2011). Stress and academic achievement among undergraduate students in Universiti Putra Malaysia. *Procedia - Social and Behavioral Sciences*, 29, 646-655.
- Houghton, J.D., Wu, J., Godwin, J.L., Neck, C.P. & Manz, C.C. (2012). Effective stress management: A model of emotional intelligence, self-leadership, and student stress coping. *Journal of Management Education*, 36(2), 220-238.
- Khodarahimi, S., Hashim, I.H., & Mohd-Zaharim, N. (2012). Perceived stress, positive-negative emotions, personal values and perceived social support in Malaysian undergraduate students. *International Journal of Psychology and Behavioral Sciences*, 2(1), 1-8.
- Kumaraswamy, N. (2013). Academic stress, anxiety and depression among college students - a brief review. *International Review of Social Sciences and Humanities*, 5(1), 135-143.
- Lazarus, R. S. (2000). *Stress and Emotion: A New Synthesis*. New York, NY: Springer.
- Manz, C.C. (2003). *Emotional Discipline: The Power to Choose How You Feel*. San Francisco, CA: BerrettKoehler.
- Ramteke, I. V., & Ansari, J. (2016). Stress and Anxiety among first year and final year Engineering students. *Stress*, 3(4).
- Redhwan A.A.N., Sami A.R., Karim A.J., Chan R., Zaleha M.I. (2009). Stress and coping strategies among Management and Science University students: A qualitative study. *Int Med Journal*, 8(2), 11-15.
- Roddenberry, A., & Renk, K. (2010). Locus of control and self-efficacy: potential mediators of stress, illness, and utilization of health services in college students. *Child Psychiatry & Human Development*, 41(4), 353-370.
- Salam, A., Yousuf, R., Bakar, S.M.A., & Haque, M. (2013). Stress among medical students in Malaysia: A systematic review of literatures. *International Medical Journal*, 20(6), 649-655.
- Shamsuddin, K., Fadzil, F., Ismail, W. S. W., Shah, S.A., Omar, K., Muhammad, N.A., Jaffar, A., Ismail, A. & Mahadevan, R. (2013). Correlates of depression, anxiety and stress among Malaysian university students. *Asian Journal of Psychiatry*, 6(4), 318-323.
- Tangade, P.S., Mathur, A., Gupta, R., Chaudhary, S., (2011). Assessment of stress level among dental school students: an Indian outlook. *Dental Research Journal*, 8(2), 95-101.
- Uehara, T., Takeuchi, K., Kubota, F., Oshima, K., & Ishikawa, O. (2010). Annual transition of major depressive episode in university students using a structured self-rating questionnaire. *Asia-Pacific Psychiatry*, 2, 99104.
- Usha, S. & Solomon, D. (2017). Level of depression, anxiety and stress among final year Engineering students in a private sector. *Research on Humanities and Social Sciences*, 7(17), 17-20.
- Waghchavare, V.B., Dhumale, G.B., Kadam, Y.R. & Gore, A.D. (2013). A Study of Stress among students of professional colleges from an urban area in India. *Sultan Qaboos University Medical Journal*, 13(3), 429.
- Walburg, V. (2014). Burnout among high school students: A literature review. *Children and Youth Services Review*, 42, 28-33.
- Yasin, M.A.S.M. & Dzulkifli, M.A. (2011). Differences in depression, anxiety and stress between low-and highachieving students. *Journal of Sustainability Science and Management*, 6(1), 169-178.