

AN ANALYSIS OF LEARNING STRESS LEVELS IN ONLINE AND DISTANCE LEARNING (ODL) AMONG FIRST AND SECOND YEAR TECHNICAL ENGINEERING STUDENTS DURING COVID -19 PANDEMIC

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ABSTRACT

The Covid-19 pandemic led to the closure of higher education institutions and the forced implementation of online learning in an attempt to reduce the spread of Covid-19. The lockdown and movement restrictions have changed students' daily lives substantially and forced them to adjust to new norms in studying which increased concerns towards their stress levels. This research attempts to identify the perceived learning stress levels among first and second year students during the pandemic. Based on the convenience sampling approach, an online questionnaire adapted from the Perceived Stress Scale (PSS) and renamed as Perceived Learning Stress Scale (PLSS) was used to collect data from 113 first and second year technical engineering students to analyze their learning stress levels primarily from the impact of the online learning shift. Statistical Package for the Social Sciences (SPSS) software was used to analyze the learning stress scores and its relevance. The findings reveal that the majority of students experienced moderate to high level of learning stress and the presence of significant association between the semester of study and number of credit hours taken with the level of stress they experienced. Despite the study indicating that the students experienced stressful emotions due to learning platform shift, they also developed positive emotions such as confidence and ability to handle and control the learning problems and stress as they have adapted to the prolonged online learning conditions.

Keywords: Perceived stress, learning stress levels, online learning, pandemic lockdown.

INTRODUCTION

The Covid-19 pandemic has brought on a multitude of concerns and apprehensions among people throughout the world. Countries were forced to adapt to the restrictions and limitations set by their governments which include the closure of many public facilities. Educational institutions were not spared and had to undertake the pain of adjusting through online means (Sheroun et. al., 2020). This manifestation is not exclusive as many universities worldwide have taken preventive measures and transitioning towards online based learning and exams (Aslan et. al., 2020). Lai et al. (2020, p.2) further states that "...disruptions due to the pandemic can exert unique additional pressures, adversely

affecting students' mental health, with impacts including increased stress, anxiety, and depression". This transition into new academic environment filled with new demands has caused stressors to emerge that learners need to adapt and adjust to. This in turn can affect their stress level and mental well-being. The IESALC-UNESCO (2020) team believe that frustrations with online class stems from the fact that lesson contents used were not designed for online environments rather as an ad-hoc effort to substitute face to face learning.

The increasing global fear and anxiety due to Covid-19 pandemic may lead to the increase in mental health problems which include psychological stress (IESALC-UNESCO, 2020). Baltà-Salvador et al. (2020) categorize psychological stress as a phenomenon occurring from an imbalance between a person's perception and external demands. Phillips, (2013) defines perceived stress as the feelings or thoughts that an individual has about how much pressure they are under at a given point in time and this includes feelings of helplessness, lack of control and lack of predictability of one's life. The lockdown has caused the closure of higher education institutions which led to a widespread adoption of online education (Nordin & Nordin, 2020). Recurring university closures have prevented students from returning to regularity and force them to shift to online classes as the core mode of learning (Kamal et al., 2020). However, it is not easy to adopt or adapt full online learning without encountering challenges and problems. Studies reported that both academic staff and students are facing multiple obstacles and challenges in conducting online learning (Jelińska & Paradowski, 2021). Ahmad, Ab. Rahim and Ahmad (2021) found that online learning albeit being actively promoted to be the main stream method was not carried out in full-swing by academicians until the outbreak of the Covid-19 pandemic that forced its inevitable use for teaching and learning purposes.

Students were forced to stay home and changed from face to face learning to new methods, online. Teaching and learning requires sudden adjustment to prioritize the safety of teachers and students. This transition in daily practices has altered behaviors and has induced additional stress or stressors. At the onset of the pandemic, teachers and students were required to undergo classes online in haste and with limited prior experience and lack of pedagogical strategies for online learning although digital integration in education was timely and ongoing (Manap, Ahmad & Zakaria, 2021). Moreover, the range of familiarity, competency and ease of exploring the full potential that the online tools and online platform or management system offer, vary between educators (Ahmad, Rahim & Ahmad, 2021).

It is therefore relevant to gauge learners' level of stress in the new learning environment due to the platform shift. Due to this, this present study aims to examine the perception of university students on their stress levels due to online and distance learning during the Covid-19 pandemic movement restrictions. Possible reasons for the stress levels were also explored in order to provide a complete picture of the phenomenon in which the students' current learning situation is perceived as stressful.

Online learning refers to the process of learning and teaching using online platforms where instructors and students communicate virtually (Al-Kumaim, et al., 2021a). During the lockdown phases, the online platform is the best alternative to be utilized by the universities and other higher education institutions to ensure that education activities could resume without direct

contact and are carried out as effectively as possible (Khan & Qureshi, 2020). Social distancing measures and transition to online learning at higher educational institutes affect students psychologically, and this consequently lead to enormous stress (Mohammed, Uddin & Saidi, 2020).

The transition to online learning has also been challenging for technical engineering students as the learning process is based on a lot of practical applications, laboratory classes, and direct contact with teachers and other students (Baltà-Salvador et al., 2021). These obstacles and challenges include technical issues such as unfamiliarity towards online technologies platforms, limited internet access and unavailability of online learning devices, insufficient experience to participate, interact and engage in online learning, inadequate well-designed assessment process to measure online learning outcomes and lack of experience to develop online courses content (Al-Baadani & Abbas, 2020). A number of studies also revealed that other challenges like the lack of support from institution, lack of understanding from family members, having to spend too much time using a PC and being given excessive quantities of work to complete (Al-Kumaim et al., 2021b). Investigations also pointed out that students have experienced an increase in stress, anxiety, and depression (Saravanan et al., 2020), and have felt some negative feelings intensified, such as fear, worry, or boredom (Aristovnik et al., 2020). Nonetheless, the impact related to pedagogical aspects of online teaching, such as quality and adaptation of the course, may be more negative at the beginning of the pandemic due to the uncertainty of the situation (Canet-Juric et al., 2020). These aspects may improve gradually due to improvements on the online teaching practices and students' preparation for their online learning experience (Scull et al., 2020).

Psychological problems can be exacerbated because of social distance and lockdown that have been implemented as preventive and safety measures to prevent covid-19 infection (Aslan et al., 2020). Stress can be understood as a perceived non coordination between the demands required in daily living and an individual's capability to respond (Dwivedi et al., 2020). A research conducted in 41 countries revealed that significant higher scores of perceived stress were observed among women, youth, students, and among those who expressed concern and those who perceived increased susceptibility to the Covid-19 (Limcaoco et al., 2020). Students are prone to further worsening these feelings during Covid-19 lockdown due to social isolation, uncertainty, and abrupt transitions (Kohls et al., 2021). The available studies reported a high perceived stress level among students during the current pandemic (AlAteeq, AlJhani & Al Easa, 2020). Findings in other studies indicated that students have been experiencing stress correlated with adaptation of new norms in daily routines as well as in teaching and learning (Aylie, Mekonen & Mekuria, 2020).

RESEARCH METHODOLOGY

The research employed a purposive sampling method where online questionnaires were distributed to a purposive sampling of First and Second Year Bachelor Degree students of a private Technical Engineering University in Selangor, Malaysia. These samples were selected based on time of entry into the university at the onset of Covid-19 pandemic and during the

pandemic. Prior to 2020, they were attending 1 year pre-university, matriculation or foundation studies at colleges or high schools. These undergraduates were the most affected by the pandemic as they were just beginning their tertiary studies at the university. All restrictions, regulations and changes that come about affected them directly as new university undergraduates in 2020 and 2021.

This survey was done during semester February 2021 starting from May until June 2021. 113 students from Semester 1 until Semester 4 responded fully to the Perceived Learning Stress Scale (PLSS). This PLSS was adapted from Cohen, Kamarck and Mermelstein (1983) called PSS-10. PLSS questionnaires comprising ten questions measuring students' perception on learning stress became the data elicitation instrument as a mean to understand learning stress present in this pandemic due to the learning shift experienced by the students. The PSS-10 was adapted to focus on perceived learning stress, to delve specifically into the shift of learning mode and platform, and its effect on stress level, whether significant or otherwise. The questionnaires incorporated four positively stated items (Items 4, 5, 7 and 8) and was adapted to include online learning shift and the impact of new ODL platform usage which has less face to face engagement and more online assessments.

The survey utilizes a 5-point Likert scale (0 = never, 1 = rarely, 2 = sometimes, 3 = frequently, 4 = always) to capture the students' responses. The categories were changed from PSS-10 (0 = never, 1 = almost never, 2 = sometimes, 3 = fairly often, 4 = very often). The PLSS question items use terms which are more commonly used in Malaysia and closest in meaning to the PSS-10. In calculating the total score, the score for the four positively stated items (Items 4, 5, 7, 8) were reversed. The total score follows PSS-10 score band whereby total scores are categorized as 0-13 (Low Stress), 14 -26 (Moderate Stress) and 27-40 (High Stress). The analysis was performed using the Statistical Package for Social Sciences (SPSS) software version 26 by running the Likelihood Ratio analysis to determine the significance of the findings present in the data.

RESULT AND DISCUSSION

In the questionnaire, two demographic items were included namely semester of study and credit hours or study load (hereon referred as credit hours). These were evaluated as relevant descriptive information in identifying the learning stress of respondents as university students (Gournelos et al., 2019). A number of students responding to each stress band were calculated to produce an overall picture of the students' learning stress level as displayed in Table 1 and 2 below.

Table 1: Students' Stress Level According to Semester

Semester	Low Stress (Band 0-13)		Moderate Stress (Band 14-26)		High Stress (Band 27-40)	
1	5	8.8%	50	87.7%	2	3.5%
2	1	11.1%	6	66.7%	3	30.0%
3	1	6.3%	11	68.8%	4	25.0%
4	1	3.3%	19	63.3%	10	33.3%

Based on semester, low learning stress was recorded from Semester 1 until Semester 4. This resonate credit hours” analysis as mostly the frequency is noted at less than 10% with the highest of 11.1 % in Semester 2. However, a stark contrast is observed between the stress bands as moderate stress was predominant in all four semesters of the students „undergraduate studies with the highest count at 87.7% in Semester 1 and maintaining at 60% and higher from Semester 2 until Semester 4. High learning stress occurs in all four semesters with notable increment from Semester 1(3.5%) to Semester 4(33.3%).

Table 2: Students,, Stress Level Based on Credit Hours Taken

Credit Hours	Low Stress (Band 0-13)		Moderate Stress (Band14-26)		High Stress (Band 27-40)	
	Count	Percentage	Count	Percentage	Count	Percentage
6-9 Hours	0	0.0%	5	100.0%	0	0.0%
10-12 hrs	1	7.1%	11	78.6%	2	14.3%
13-15 hrs	0	0.0%	10	90.9%	1	9.1%
16-18 hrs	0	0.0%	33	80.5%	8	19.5%
19-21 hrs	0	0.0%	31	73.8%	11	26.2%

The data in Table 2 displays the percentage of students and their stress level according to credit hours taken. Learning stress is considerably high when total scores reach moderate stress band and high stress band. This is based on the assumption that students” responses are showing tendencies of leaning towards “sometimes” and upwards (i.e. “frequently” and “always”). Moderate learning stress was recorded for all students with low credit hours (6-9 hours). When carrying higher credit hours the tendency to experience high learning stress increased further as the case for 19.5 students with heavy credit hour load of 16-18 hours. For 19-21 credit hours the percentage of students reporting high level of stress increased to 26.2%. The three stress bands reflect different observations. Low stress only achieves less than 10% of response for 10-12 hours (7.1%). On the other hand, moderate stress does not record anything lower than 70% occurrence. , noting 73.8 % is the lowest and it reached up to 100%. High learning stress reveals no occurrence for the lower credit hour of 6-9 hours and picks up at 10-12 hours (14.3%) onwards.

Table 3: Students Perception of Stress Level in Learning

No	Survey Item	Never	Rarely	Sometimes	Frequently	Always
1	I feel upset due to online platform shift.	9 (7.9%)	13 (11.5%)	54 (47.8%)	26 (23.0%)	10 (8.8%)
2	I cannot control the way of studying.	8 (7.1%)	10 (8.8%)	39 (34.5%)	34 (30.1%)	22 (19.5%)
3	I feel stressed during online classes.	8 (7.1%)	24 (21.2%)	23(20.4%)	38 (33.6%)	20 (17.6%)
4	I have opportunity to find ways to handle online learning stress.	6 (5.3%)	29 (25.7%)	43 (38.1%)	24 (21.2%)	11(9.7%)

5	I feel that my study is on track.	13 (11.5%)	23 (20.4%)	47 (41.6%)	25(22.1%)	5(4.4%)
6	I feel that I am unable to cope with assignments or assessments	8 (7.1%)	16 (14.1%)	44 (38.9%)	32 (28.3%)	13 (11.5%)
7	I feel that I am unable to control learning stress	8 (7.1%)	8 (7.1%)	68 (60.17%)	22 (19.5%)	7 (6.2%)
8	I feel confident in handling study related problems.	6 (5.3%)	16 (14.1%)	52 (46.0%)	32 (28.3%)	7 (6.2%)
9	I feel angry due to uncontrollable learning situation.	7 (6.2%)	17 (15.0%)	41 (36.2%)	35 (30.9%)	14 (12.38%)
10	I feel that I am unable to overcome increased learning difficulties.	5 (4.4%)	10 (8.8%)	50 (44.24%)	31 (27.4%)	17(15.0%)

Table 2 illustrates the findings from the PLSS data collected. A total of 113 first and second year students answered the survey in full. The findings include students' frequency of feeling upset over the shift from face to face classes to online classes recorded at 47.8% marked as "sometimes" as the highest, while the frequency of inability to control the way of studying had 53.6% of students answering in the "frequently" and "always" range. The next question relates to feeling of stress during online classes where the majority chose "frequently" as their answer (33.6%). For question 4, respondents were asked on the opportunity to handle online learning stress which resulted in "sometimes" as the highest response at 38.1%. This was followed by a question which dealt with students feeling that their study was on track. Majority responses leaned towards "sometimes" and "frequently" category at 63.7% , entailing the presence of positive outlook. However, when asked about their inability to cope with assignments and assessments, most students responded "sometime" and "frequently". When asked about their ability to control learning stress levels, a staggering number responded "sometimes" which stood at 60.2%. Nevertheless, when questioned whether they can confidently handle study related problems, many students opted for "sometimes" at 46.0% and "frequently" at 28.3%. Despite the respondents scoring a high response indicating learning stress was occurring, the positively stated items allowed the research to reveal their steady feeling of confidence amidst the stress. This in turn does not indicate the students were always feeling angry based on a combined total of 67.1% responding "sometimes" and "frequently. Perhaps it was a way of releasing stress and voicing out of frustrations. Not actually due to helplessness and uncontrollable learning situations. The survey was concluded by asking the students their feeling that they are unable to overcome increased learning difficulties as to which again, most opted a combined total of 71.6% for "sometimes" and "frequently".

Table 4: Students' Perceived Learning Stress Scale (PLSS) Overall Results

Level	Count	Percentage
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Low Stress (0-13)	8	7.08%
Moderate Stress (14-26)	86	76.11%
High Stress (27-40)	19	16.81%

In general, the mean value of the PLSS was 21.57 ± 6.35 . The absolute range noted in the data was 3-40, with a median value of 21. Table 4 illustrates the final percentages of students with low, moderate and high learning stress levels. More specifically, at the 25th, 50th and 75th percentile the values are 18, 21 and 25 respectively. This clearly indicates that more than 50% of the respondents fell into the moderate stress band. Significantly, the students experienced moderate level of learning stress at 76.11% while 16.81% of students fell in the high stress band. The lowest was recorded for low stress band at 7.03%. This result exhibits the disproportioned stress experience that heavily tips the scale towards moderate stress and high stress. Therefore, as the duration of semester progresses, the learning stress increases for students.

The PLSS survey addresses multiple stressors primarily caused by the change to online learning platforms. As what it intends to follow from PSS-10, stress evaluation survey provides data for identification of patterns which can be retrieved from the string of data collected (Allam et al., 2020). There were significant associations between the level of learning stress and the forced changes that had to be undertaken during the lockdown (Al-Ateeq, AlJhani & AlEasa, 2020). The moderate to high percentage responses given for each survey items in this present study depicts this association. Most students find it challenging to cope with the situation of undergoing learning while in lockdown. Emotion items such as feeling “upset” and “stressed” topped the scale with most marking “sometimes” and “frequently”. The lack of physical contact with lecturers and peers, lack of opportunity for relationships and maintaining social life also impact students’ mental and social well-being and this could be seen from the high percentage of „sometimes“ and „frequently“ responses, garnering the top two spots for items regarding inability to cope with assignments and increasing learning difficulties.

This study has provided a clear evidence of the strong association between students’ stress levels and the time spent in learning (credit hour taken and semester) while being in lockdown online learning conditions. Due to Covid-19 lockdowns, the university experience become a more isolated and lonely learning experience. Having most assignments relying on online delivery for instructions and submission leaves little or no opportunity for students to personally contact peers and meet lecturers face to face. With lessening assistance in the learning process, students are unable to effectively seek clarification on tasks. This resonates what Al-Kumaim et al. (2021a) found in their study where 69.5% of university students that participated felt they were overloaded with information and work when following the online courses during the semester. More significantly, the impact of online learning with little or no assistance adversely affect their motivation to learn, self-efficacy and sense of autonomy (Kohls et al., 2021). Consequently, students have to modify the way they work to complete assignments and be more realistic in managing their learning expectations. Espino et al. (2021) observed negative emotions among students especially towards instructional format and focus where they displayed

more anxiety when faced with new type of formats and new form of workloads. All these are taking place during ODL while being away from the learning institution and individually at home. Adjusting to these learning challenges leads to the prevalence of higher stress levels among students. .

This present study has revealed from the responses to the positive items in the survey that students“ have the ability in handling learning stress and they have optimistic outlook of their study, to be going as planned. Majority responded “sometimes” and “frequently” to the items inquiring on handling of the increasing stress. The students also gave similar predominant response (“sometimes” and “frequently”) about feeling confident to manage study related problems. This shows an encouraging outlook as students are constructively adapting to their current learning situation. Although negative emotions were prevalent in contributing to students“ moderate and high learning stress count, the presence of positive emotions should be accorded the same importance. Gaeta, Gaeta and Rodriguez (2021) cautioned researchers to carefully evaluate the significant presence of negative emotions such as anxiety and frustration inonline learning during pandemic, as this may signal the development of positive personal experiences as well. To an extent, negative emotions may help learners to cope with the uncertain situations by modifying behavioural patterns to better adapt and to set expectations thatare more realistic. Baltà-Salvador et al. (2021) highlighted that the first phase of lockdown in many countries were riddled with disorientation due to the new the situation. However, the situation is normalized when the lockdown prolongs, and students start to assimilate better to their learning conditions.

CONCLUSION

This research provides understanding and insights into what students are feeling while undergoing online learning during pandemic lockdown. Investigating the level of stress experienced by students has paved the way for educators to understand the effect of learning platform shift towards their students. The research primarily found that students were facing moderate stress followed by high stress level where they reported feeling of upset, anxiety and anger due to limitations in the online learning mode. They were also experiencing challenges to control the way they study, to cope with given assignments and assessments as well as to overcome learning difficulties. Despite the stressful emotions, they were confident and still able to handle some learning problems and stress as they gradually adapt to the prolonged lockdown. Additionally, significant association was discovered between the stress level, the credit hours taken and the semester of study in terms of increase in learning stress. Future studies could include a bigger sample size, or incorporate teachers“ perspectives regarding the ODL shift whendelving into students“ online learning challenges.

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