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Students' perceived stress between online and offline learning modes: Impact on students' academic engagement and well-being

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Article Info

Abstract

Academic activities have already returned to normal. As the academic community struggled to bring comfort to students after the two-year online learning mode, the crucial question now is—which mode of learning suits best among the students these days? This present study investigates the perceived stress of university students during online and offline learning modes, and how these affect their academic engagement and well-being. It specifically determines whether the online class brought a higher degree of stress than the offline class, or vice versa, and how they accordingly affect students' personal conditions. Using the rule of the thumb, 644 university students in Thailand were surveyed using a self-administered questionnaire that contains such scales as Perceived Stress Scale, Utretch Work Engagement Scale for Students and Satisfaction with Life Scale through Google forms. With the use of PLS-SEM, the results of the study discovered that students' perceived stress during the online and offline learning modes both significantly affect their academic engagement and subjective well-being such that the higher stress they perceived both in online and offline learning modes, the lower their academic engagements and well-being are.

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Introduction

As the academic community has returned to conduct classes offline, the emergent issue facing students these days is their apparent adjustment to the school-based class system. As most of the students have become more adept in their mechanisms on how to navigate online learning, the tedious tasks of completing assignments and academic requirements inside the classroom have growingly become a major concern as these bring about new types of stress. Lazarevic and Bentz (2020) reported that students from traditional face-to-face classroom experienced more stress compared to those who take online courses since traditional, face-to-face interaction demands more social skills, which are practically absent during the online learning mode. In the time of the pandemic,

symptoms of depression, anxiety and stress have markedly affected university students (Höhne et al., 2022) but evidence showed that the same symptoms have also been observed when students return to face-to-face classes (Estrada-Araoz, et al., 2023). These conditions pose a serious concern that calls for a thorough investigation (Castro et al., 2023).

Studies conducted at the height of the pandemic regarding students' adaptation to online learning have shown that there was an apparent prevalence of stress and mental health problems among the students (Höhne et al., 2022). This is the case since they have been observed to struggle with academic workloads chiefly brought about by their separation from school and the imminent fear of contagion (Yang et al., 2023). These conditions are exacerbated by the students' seeming unfamiliarity of the online environment and the uncertainty about their future (Nuryana, et al., 2023). These then resulted in their low academic performance and delay in the completion of assignments and school-related tasks (Madhusanka, et al., 2021). Even with the hybrid learning system implemented at the early part of the pandemic, students found it to be unfavorable as the workload, and time differences between in-person and online instructions were putting too much pressure to them (Khoirunnisa et al., 2023; Licayan et al., 2020).

But the return to the face-to-face class system or offline learning mode did not bring any decrease to the students' levels of stress since Estrada-Araoz et al (2023) found that symptoms of depression, anxiety and stress were reported by students once they went back in campus. This apparent resistance could have been because students had already become accustomed to their online learning mechanisms such that commuting or travelling to school, interacting with people, and doing things right on time were overwhelmingly stressful as they grapple to fulfill all their classroom obligations, and at the same time, adjust to their new daily routine. Traditional, face-to-face interactions demand more social skills and adroitness that were not necessarily stringent during online learning (Lazarevic & Bentz, 2020).

These interesting claims regarding the perceived stress experienced by students during online and offline learning modes have been the primary aim of this present study as it intends to investigate whether the stress perceived by students during online and offline learning modes have significant effects towards their academic engagement and well-being. It categorically investigates whether students' experience higher stress in the online learning mode than face-to-face class encounters or vice versa, and how they have affected their engagement to the course and general well-being.

Literature Review

Academic Stress

The World Health Organization (2023) defines stress as people's reaction to the demands and pressures that require them to exhaust mechanisms in order to cope. Stress also surfaces when these demands and pressures are excessive (Chandra, 2021), and do not match the knowledge and ability of an individual. Stress is a common condition experienced by everyone; however, the way in which such is managed or handled differs significantly when it comes to the individual's age, and their social and cultural backgrounds (Madhusanka, et al., 2021).

Stress experienced by students is commonly drawn from their fear of failure and loss of grades (Babicka-Wirkus et al., 2021). Academic stress is the state whereby students experience a magnanimous academic burden that sometimes gets out of hand and difficult to handle (Fathiyah, 2021). Academic stress usually brings about the feeling of helplessness, which then leads to anxiety and worry. Even before the pandemic era, studies had established that university students are a particularly vulnerable group when it comes to the prevalence of stress and mental health problems (Höhne et al., 2021). This is also accentuated by their transition to independent, adult life (Babicka-Wirkus et al., 2021).

The academic stresses that students experience come from many academic demands, which include environmental, social, or internal stressors, which require them to make certain, unavoidable adjustments. Fathiyah (2021) mentioned that the major source of academic stress among the students is the subject itself since their difficulty in understanding the learning material leads to the feelings of annoyance, doubt, helplessness, and anxiety. During the pandemic, these experiences on academic stress became more pronounced since students had to adopt to the new learning system. Numerous studies have proven that students experienced a high level of stress during the two-year online class because of academic pressure (Chandra, 2021), unfamiliarity of the online environment (Nuryana et al., 2023), new learning modality (Locion et al., 2022), unreadiness and lack of facilities and infrastructure (Khoirunnisa et al., 2023), and academic workload, separation from school and fear of contagion (Yang et al., 2023). But Lazarevic and Bentz (2020) reported that students from traditional face-to-face classroom experienced a slightly more stressful environment compared to those taking classes online since they are deprived of the time to study, have less

accessibility to learning materials, encounter pressures from social group and disconcerting expectations from their family and friends. Online classes on the other hand, are considered to be more flexible, as the accessibility of learning materials is easy as they are available online, which prompt less perception of social stress.

Academic Engagement

Students' engagement in academic activities has always been a prime concern among educational institutions as it has been found that academic engagement is highly correlated with academic performance (Delfino, 2019; Sukor et al., 2021). Engagement is a complex term as it encompasses various aspects of behavioral, cognitive, and emotional dimensions (Fuertes et al., 2023) that operate concertedly to project a positive approach in the learning process (Nag et al., 2022). Academic engagement connotes the students' investment of their time and energy in their educational activities (Abla & Fraumeni, 2019), which carries on a sustained and meaningful connection between the students and the learning they have in school (Fletcher et al., 2019).

The COVID-19 pandemic has shifted students' engagement in learning. Hollister, Nair et al. (2022) reported that students during the online learning mode had struggled connecting with their friends and instructors, which affected their engagement in lessons and learning materials (Castro & George, 2021). Loneliness and forced solitude caused a variety of problems, which significantly reduced students' academic engagement (Hendrick et al., 2023) as also evidenced by their lower attendance in classes (Mckenna et al., 2022). Thus, emotional support has been found to be what the students need during the distance learning mode (Alghanmi & Nyazi, 2022) as well as improving their intrinsic motivation such as their interest toward learning, perceived competence, and perceived choice as such decreases academic tension and pressure and enhances their academic engagement (Prakasha et al., 2023). But when it comes to face-to-face set-up, academic engagement has been found by some studies as more effective. Darling-Aduana et al (2022) found that students who were given a higher proportion of instructional days in the face-to-face mode experienced higher academic growth compared to those in the virtual mode. Students' behavioral, cognitive, and emotional engagements have also been found to have been impacted positively when classes were also brought back to the face-to-face system (Anierobi et al., 2022) as they become more efficient with their time (Simic et al., 2022).

Well-Being

Well-being has been regarded as being similar to positive mental health (Ruggeri et al., 2020). It is essentially the experience of positive emotions such as contentment, satisfaction, and happiness. Achieving sound mental health is tantamount to an experience of having the utmost control in one's life at the same time feeling the personal sense of purpose (Dhanabhakyam & Sarath, 2023). Well-being affects many of an individual's life dimensions and it correspondingly *is* affected by many different factors (Wistoft, 2021).

The COVID-19 pandemic has deterred the well-being of the students (Villani et al., 2021). The sudden shift towards online class has brought immense psychological distress among the students as they grapple to make sense of online learning at the same time adjust to life within the house and in front of the computer screen (Dodd et al., 2021). It has caused intense anxiety and depression, which led to the distracted well-being of the students (Jones et al., 2021; Villani et al., 2021). However, when back to the face-to-face class mode, students' well-being has also been reported to have been apparently affected mainly due to the adjustments they have to make in terms of ferrying themselves to school as well as adjusting to social bonds (Estrada-Araoz et al., 2023). A study found that students' stress levels were above critical thresholds (Schwartz et al., 2021) when advised to return to school. In fact, in a study conducted in 2018 that compares the impact of online and face-to-face learning among graduate students, it appeared that the online format is more preferred since students find it more manageable than the face-to-face courses (Mather & Sarkans, 2018). This implies that there is this apparent need to investigate students' well-being now that classes are fully conducted on campus.

Theoretical Framework

This present study is anchored on two stress theories, which are the General Adaptation Syndrome (GAS), which was postulated by Selye (1976) as well as with the Cognitive Activation Theory of Stress (CATS) by Ursin and Eriksen (2010).

The GAS was taken into consideration because it provides a classic explanation of why stress takes place. According to this theory, stress happens because it disrupts the normal functioning of the body, which is crucial in maintaining well-being. Stress as claimed by GAS, is the main reason why people have varying health problems. This is primarily because the person was not able to adapt to the situation caused by the stressor.

In the diagram shown below, an individual person first experiences the alarm reaction when faced with the stressor. Upon acknowledgement of the presence of the stressor, that individual would try to rationalize and resist the imminent change. If the resistance goes beyond the normal level, it leads to exhaustion, which then causes extreme stress to the individual. This stress apparently brings out certain health issues such as illness or diseases, or such mental conditions as anxiety and depression.

Taking the lens of online and face-to-face classes, the theory well explains the experiences of the students. During the pandemic, online classes brought about an intense and alarming level of stress as students were ill-prepared for what was to come. Aside from the adjustment they had to make with the online system, the fear of contagion also brought about certain levels of stress. The idea of learning online was resisted, until those who were not able to cope felt exhausted and dropped out of school or developed such symptoms as depression and anxiety.

The same occurred when classes were brought back to offline learning. After the lifting of restrictions of crowd gathering and wearing of face masks, academic institutions were quick, yet careful in bringing back the students to university campuses. Initially, there were certain restrictions imposed but eventually everything went back to normal. This of course, brought about a different kind of experience for students after having comfortably adjusted to the online learning system for more than two years. This change was not welcomed positively by many as they had to adapt to the changes in their routine, had to meet different people and up their guard against requirements for social interaction not to mention the academic tasks and assignments that needed to be fulfilled, which are somewhat different from that of the online class system.

These changes, however created varying impacts on students. Perhaps, some may have found it tedious, yet others found it refreshing. Thus, the CATS was also taken into consideration as a theory base for this present research since it contends that "stress response depends on acquired expectancies of the outcomes of stimuli and available responses" (Ursin & Eriksen, 2010). In CATS, stress response is brought out by alarm activation, subjective experience load and subjective experience response of an individual, which could vary depending on how they process the stressful experience. When they manage such with positive expectancy, they therefore, experience better regard to the situation, which the theory terms as train or phasic arousal. On the contrary, those who sustained the arousal and were unable to adapt well to stress, would eventually experience strain, which is also called sustained catabolic experience.

In terms of the online and offline classes, students who have responded well to change may experience better adjustments and keep their well-being at good form. But for those who found the change stressful, they continue to feel strain and may not adapt very well. This brings about certain strains in their academic engagement and well-being.

Hypotheses

Based upon the above-mentioned exposition of related literatures and evaluation of previous research, the following are the proposed hypotheses for this present study:

H1. Perceived stress during online learning mode has negative relationship towards students' academic engagement.

H2. Perceived stress during online learning mode has negative relationship towards students' well-being.

H3. Perceived stress during offline learning mode has negative relationship towards students' academic engagement.

H4. Perceived stress during offline learning mode has negative relationship towards students' well-being.

Methodology

Sample and Data Collection

The participants in this study were students attending a private international university in Bangkok, Thailand. To collect the data, a self-administered survey questionnaire was employed, and the questionnaire was designed using Google Forms. It contained such scales as the Perceived Stress Scale, Utretch Work Engagement Scale for Students and Satisfaction with Life Scale. The survey link and QR code were distributed to the target respondents. The researchers sought permission from the lecturers before the conducting of the data collection process. However, participation in the data collection was voluntary, and students were encouraged to take part in the survey. The entire data collection process spanned approximately one month to complete, and using the rule of thumb, a total of 644 respondents participated in the survey. According to this rule, a larger sample increases the statistical power of the evaluation, and at the same time, if the effect size is small, the evaluation needs a larger sample to achieve a given level of power

(Ranatunga et al., 2020). In an unknown population such as in this present study, around 300 respondents were the given rule but obtaining a higher number of respondents provides better analysis of the data, thus gathering a higher number of the total participants (Aguinis & Harden, 2009). The demographic information of the participants is presented in Table 1.

Table 1 Demographic characteristics of the sample

Demographics Factors	Descriptive Statistics	
	Category	Number (%)
Age	18–21 years old	474 (71.4)
	22–25 years old	175 (26.4)
	26 and above	15 (2.3)
Gender	Female	390 (58.7)
	Male	239 (36.0)
	LGBTQ+	35 (5.3)
Faculty	MSME	544 (81.9)
	Comm Arts	15 (2.3)
	Arts	62 (9.3)
	Others	43 (6.5)
Nationality	Thai	442 (66.6)
	Non-Thai	222 (33.4)
Educational Level	First year	135 (20.3)
	Second year	147 (22.1)
	Third year	226 (34.0)
	Fourth year	155 (23.3)

Measures

Control variables

The control variables for this research are the following: age was measured in number of years, gender was coded as a category showing 0 for female and 1 for male, GPA was coded as ranked variable, faculty and nationality were coded as categorical variable and year level was as coded as ranked variable.

Statistical analyses

The researchers employed partial least squares structural equation modeling (PLS-SEM) to statistically assess the hypotheses proposed in their study. According to (Hair et al., 2017) PLS-SEM is an appropriate statistical method when the variables in the research model deviate from a normal distribution pattern. This choice was made to mitigate biased estimations resulting from the non-normal distribution of variables used in the model. The suitability of PLS-SEM was particularly advantageous for this research because, based on the Jarque-Bera normality test, the variables did not adhere to a normal distribution curve. The PLS-SEM estimation technique was performed using WarpPLS version 8.0. Table 2 shows the correlations among variables and convergent validity results.

Results and Discussion

Figure 1 shows the hypotheses results. Hypothesis 1 predicts the negative relationship between online class and students' academic engagement. The model estimation shows that there is a positive relationship between these two variables (β = -.236; p = < .001). The p value of the beta coefficient is statistically significant. Therefore, it can be concluded that Hypothesis 1 is supported.

Hypothesis 2 predicts the negative relationship between online class and students' subjective well-being. The model estimation shows that there is a positive relationship between these two variables (β = -.075; p < .05). The p-value of the beta coefficient is also statistically significant. It can be concluded that Hypothesis 2 is supported.
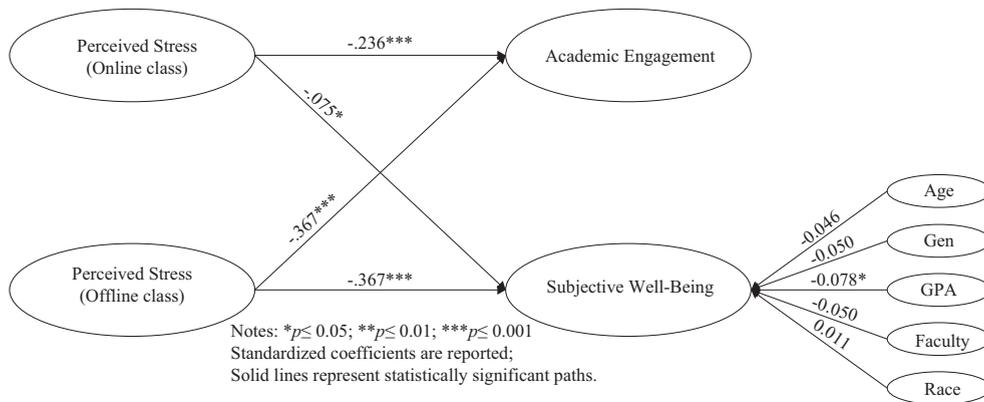
Table 2 Correlations among variables and convergent validity

Variables	Cronbach's α	CR	PSOC	AE	PSFC	SWB	AGE	GEN	GPA	FAC	RACE	LEVEL
PSOC	.850	.881	(.658)	.434***	.605***	.283***	-.026	.001	.034	-.048	.009	.009
AE	.925	.935		(.678)	.474***	.587***	-.013	-.013	.032	-.080*	.038	-.068
PSFC	.856	.886			(.666)	.355***	-.012	.022	.021	-.092*	.048	-.038
SWB	.864	.903				(.807)	-.033	-.035	.017	-.044	-.034	-.032
Age	n/a						(1)	.046	-.133***	-.035	.279***	.418***
Gen	n/a							(1)	-.150	.031***	-.013*	.016***
GPA									(1)	-.178	.075*	-.296***
FAC	n/a									(1)	-.165***	.175***
RACE	n/a										(1)	.004
LEVEL	n/a											(1)

Notes: Average variance extracted of latent variables are shown in the parentheses. PSOC = Perceived Stress (Online Class), AE = Academic Engagement, PSFC = Perceived Stress (Offline Class), AGE = Age, GEN = Gender, GPA = Grade Point Average, SAL = Salary, LEVEL = Year Level. * p < .05; ** p < .01 & *** p < .001.

Figure 1 Hypotheses results
Notes: Standardized coefficients are reported; Solid lines represent statistically significant paths.
* $p \le .05$; **$p \le .01$; *** $p \le .001$.

Hypothesis 3 predicts the negative relationship between offline class and students' subjective well-being. The model estimation shows that there is a positive relationship between these two variables ($\beta = -.367$; $p = < .001$). The p-value of the beta coefficient is also statistically significant. It can be concluded that Hypothesis 3 is supported.

Hypothesis 4 predicted a negative relationship between offline class and students' academic engagement. The model estimation shows that there is a positive relationship between these two variables ($\beta = -.367$; $p = < .001$). The p-value of the beta coefficient is also statistically significant. It can be concluded that Hypothesis 4 is supported.

Regarding the effect of the control variables, the estimation shows that subjective well-being has negative association with age ($\beta = -0.046$; $p \le .064$), gender ($\beta = -0.058$; $p = .068$), GPA ($\beta = 0.078$; $p \le .050$, faculty ($\beta = -0.050$; $p \le .060$) and race ($\beta = 0.011$; $p \le .432$). Nevertheless, only the association with GPA is statistically significant. This result suggests that subjective well-being is affected by GPA since perceived stress in both online and offline learning modes seemingly create an impact towards students' ability to navigate through various academic tasks, which potentially affect their performance that leads to lower belief in themselves, thus, creating a detrimental impact on their well-being.

This present study investigates the relationship between students' perceived stress during online and offline learning modes towards their academic engagement and well-being. As the findings supported all the proposed hypotheses, it simply indicates that both online and offline learning modes carry certain levels of stress that consequentially affect students' academic activities and their overall regard of their well-being. Therefore, the online learning mode did not bring a higher degree of stress to students as opposed to offline learning mode or vice versa yet, the sources of the stresses may vary. This resonates with what the GAS and CATS theories of stress explained, that an individual experiences stress when there is an apparent disruption in the normal functioning of the body; however, the stress response largely depends upon the how the individual perceived the effects of the stressors towards them. In the present study, it appears that students experience extreme stress both in online and offline learning mode as they abruptly disrupt their daily functioning and the majority find such disruption stressful. As to the online learning mode, it has been apparent that the shift towards the online system during the pandemic has brought about intense stress to students as they struggle to adjust to the technicalities of online learning (Castro & George, 2021; Hendrick et al., 2023; Hollister et al., 2022), but when it comes to offline learning, the same experiences of stress have been noted. This was mainly due to the situation of attending school and having to be on guard in their ability to socially interact with others (Schwartz et al., 2021; Whiting, 2022).

From among the control variables, only the GPA is statistically significant. This means that students' perceived stress during the online and offline learning modes is brought about by concerns about their academic performance. As illustrated, during online learning mode, students are concerned whether they can finish their degree (Nuryana et al., 2023) or if they are able to pass their subjects (Plakhotnik et al., 2021). The same goes during the offline learning mode; students coming back to school are mainly concerned with whether they are able to catch up with what was left out during the online learning.

Conclusion and Recommendation

This present study primarily investigated the degree of perceived stress experienced by university students during online and offline classes, and how these stresses affect their academic engagement and well-being. The findings elucidated that regardless of the learning modes—may it be online or offline—students nevertheless experience certain levels of stress due to the changes it brings. When classes were brought online due to the pandemic, students experience stress due to the newness of the learning modality, grappling for the unfamiliarity of the online learning environment, separation, and isolation from friends, not to mention the fear of contagion, which then affected their academic engagement and well-being by developing such symptoms as tardiness, laziness, anxiety, and depression. The offline learning mode did the same. Despite some claims that students prefer to learn in face-to-face classes, when returning from online learning to offline learning, students also feel certain degree of stress due to the change in their daily routine as they have to travel to school as well as the bonds that they need to form, which were not necessary during the online learning mode. Moreover, students who become comfortable with online learning would feel resistance when going back to campus as they need to wake up early, dress, make necessary preparations, not to mention that they are confined in the physical classroom where they need to pay attention all the time and cannot do their own things as with the online learning mode.

There are several limitations in the study. First, this study is limited to Thai students in one university, and this may not be the same experience and result among students in different universities or different countries. The study only determines the perceived stress of the students and not the actual stress. There might be a disparity between what the students think as stressful and what *really* is stressful in real life. Also, the study just investigated the academic engagement and well-being of the students, thus, it is the recommendation of this present study to include variables such as students' academic performance, social adjustment and other related constructs in future research undertaking of this nature. Furthermore, it is also recommended to conduct this study in another context involving students from different academic and cultural backgrounds as well as those in different year levels. It is also in the interest of this present study to consider demographic profiles such as gender and socio-economic status as variables to be investigated as well as the comparison between the adjustments of students in private educational institutions and those who are in the public school system.

Conflict of Interest

The authors declare that there is no conflict of interest.

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