Online Learning Factors and Mental Health Among Undergraduate Students

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DOI: https://doi.org/10.47772/IJRISS.2026.100700801

Received: 26 July 2026; Accepted: 31 July 2026; Published: 13 August 2026

ABSTRACT

The rapid shift to online learning has profoundly changed higher education, offering increased flexibility and access, but also with new challenges that may impact students' mental health. The purpose of this concept paper is to suggest a conceptual framework for exploring the relationship between online learning factors and mental health issues of Universiti Teknologi Mara (UiTM) students. This study explored how academic load, internet connectivity, learning environment, time management, emotional and social support impact students' stress and anxiety in an online learning context. The proposed framework is grounded in the transactional theory of stress and coping and General Adaptation Syndrome (GAS) that provides insights into the students viewpoint, coping and responses to academic and environmental stress over a prolonged period. The study utilized quantitative research methodology which was carried out by using a structured questionnaire and sent to the students of UiTM who have experienced online learning. Data will be analysed using descriptive statistics and inferential analyses using the Statistical Package for the Social Sciences (SPSS). This concept paper builds upon the existing literature by bringing together a number of online learning factors, as they relate to the larger picture of understanding students' mental health in higher education. The proposed study should yield valuable lessons for university leadership, teachers and policy makers when designing interventions, enhancing students support resources, and establishing a healthy supportive online learning environment.

Keywords: online learning, mental health, stress, anxiety, higher education

INTRODUCTION

The COVID-19 pandemic and the implementation of the Movement Control Order (MCO) in Malaysia have accelerated the adoption of online learning in higher education institutions including Universiti Teknologi MARA (UiTM). What started as an emergency response to continue learning, has gradually become a core aspect of higher education delivery (Ndibalema, 2022). Advantages of online learning include increased flexibility, accessibility and opportunities for self-directed learning. However, the sudden move from traditional face-to-face teaching to fully online learning presented university students with significant academic, technological, and social challenges (Ismail et al., 2020).

The use of online learning allows students to access educational resources at any time and from any location, but many students face difficulties in adapting to the new learning environment. These challenges include heavy academic workload, unstable internet connectivity, unconducive home learning environments, limited interaction with lecturers and peers, and increased demands for self-regulated learning and effective time management (Aucejo et al., 2020; Kristiana et al., 2023). Not only can such challenges affect students' academic performance, but also their psychological well-being.

The growing issue of students' mental health has become a major problem in higher education. Studies conducted during and after the COVID-19 pandemic consistently reported that university students participating

in online learning reported higher levels of stress, anxiety, emotional exhaustion, and psychological distress (Aristovnik et al., 2020; Son et al., 2020; Browning et al., 2021). Similarly, studies in Malaysia showed that students felt more stressed due to the excessive academic workload, limited social interaction, and inadequate internet access during online learning (Thandevaraj et al., 2021). The digital divide, poor infrastructure and unsuitable learning environments further impacted students from rural areas and those from lower socio-economic backgrounds especially, widening the education inequality gap.

The UiTM is a unique context of higher education with a large student population in a different campuses in Malaysia. Students hail from varying socioeconomic and geographic backgrounds which result in varying experiences with online learning. Previous studies of online learning and students' mental health have focused on students in general at the university level without taking into account the special characteristics of UiTM students. Therefore, there has been insufficient research on the cumulative effect of various online learning factors on the mental health of UiTM students.

While the relationship between online learning and mental health has been shown previously, the majority of studies have focused on one factor of online learning at a time, including academic burden, internet access, social support etc. Consequently, little is known about how these factors come together and impact mental health and wellbeing in a single model. Additionally, the psychological impact of online learning has been described in previous studies, but with the exclusion of other complementary theories regarding psychological stress that would account for students' perception of the difficulties encountered in their online learning and their psychological reactions to chronic stress. This makes it difficult to build up a comprehensive explanation of students' mental health in an online learning environment.

In addition, although the literature has concentrated on the negative psychological impact of online learning, few have addressed the role of protective factors like effective time management, emotional and social support that could help decrease the level of stress and anxiety experienced by students. So, the information available today reflects mental health only in part, and tends to focus on the stressors rather than on the interplay of risk and protective factors that can have a negative or positive impact on mental health.

Thus, this conceptual paper suggests an integrated conceptual framework that will explore the relationship between 5 factors pertaining to online learning (academic workload, internet connectivity, learning environment, time management, and emotional and social support) and mental health (stress and anxiety) of students. The proposed framework contributes in several significant ways to the current research. First, it has taken several factors online learning together as a whole, instead of examining them individually. Second, it integrates the Transactional Theory of Stress and Coping (Lazarus & Folkman, 1984) with the General Adaptation Syndrome (GAS) (Selye, 1956) to account for students' cognitive appraisal of the challenges they face in online learning as well as their psychological reaction to chronic stress. Last but not least, the framework is a context-specific understanding of the students' online learning experiences that can be used to support students' psychological well-being, particularly in the context of UiTM.

LITERATURE REVIEW

Online learning is now an important mode of education especially after COVID-19 pandemic and Movement Control Order (MCO) has made universities including Universiti Teknologi MARA (UiTM) to switch to digital learning platforms. However, online learning is also associated with challenges of academic workload, internet connectivity, learning environment, time management and emotional and social support, which may have an impact on students' mental health (Subramaniam et al., 2024). Thus, this literature review investigates the relation between these online learning factors and students' mental health, focusing specifically on stress and anxiety among UiTM students.

Online Learning Factors

This study identifies five critical online learning factors suspected to influence students' mental health outcomes:

- **Academic workload**: Academic tasks, assignments, assessments and studies that students are expected to undertake within a specific period of time (Yangdon et al., 2021). It incorporates objective measures like number of assignments, credit hours and study time, as well as students' perceptions of the difficulty of these requirements. Academic workload is a multi-faceted concept when thinking about online learning. These dimensions involve the workload, learning task complexity, the requirement of time (e.g. deadlines) and the extent to which he or she is expected to be assessed. In addition to the amount of work performed, students' perceptions regarding the workload have an impact on academic workload (Topală et al., 2025).
- **Internet connectivity**: the quality, reliability and availability of internet access that is needed for students to be able to participate effectively in online learning. This covers the quality of the internet connection, its reliability, the availability of broadband and access to suitable digital technology. Access to reliable internet allows learners to join in with their synchronous online classes and access the learning, engage in conversation and complete work without interruptions. On the other hand, weak and intermittent connectivity can negatively impact the learning process, limiting students' ability to access the educational resources they need and to engage with lecturers and classmates, thus exacerbating digital inequality in higher education (UNESCO, 2023; Agormedah et al., 2020).
- **Learning environment**: defined as the physical, social, technological and psychological conditions that affect students' learning experiences in an online environment (Cleveland-Innes & Campbell, 2012). In online education, the learning environment generally refers to the home setting in which students attend virtual classes, complete assignments, and engage in self-directed learning. An ideal learning environment should involve a quiet and dedicated study area with proper lighting, proper digital devices, reliable internet connection and less distraction. A supportive psychological climate is also introduced to help students focus, stay motivated and handle academic duties alongside their personal lives. In prior research, a positive atmosphere in online learning has been found to enhance students' engagement, attention, academic performance, and psychological well-being (Martin & Bolliger, 2018).
- **Time management**: refers to students' ability to plan, organise, prioritise and allocate their time in an effort to achieve academic goals in an online learning environment. It includes managing study time, attending synchronous classes, completing asynchronous learning activities, meeting assignment deadlines, and balancing academic and personal commitments. The increased flexibility and the need for higher levels of self-regulated learning in online learning make effective time management essential to sustaining learning engagement and academic achievement. Students who manage their time well tend to be more organized, meet deadlines and have less academic stress. Poor time management has been linked to procrastination, lower academic performance and greater psychological distress (Cao et al., 2023; Mou, 2023).
- **Emotional and social support**: defined as the perceived availability and quality of support from family members, friends, peers, lecturers and the university in coping with academic and personal challenges (Zimet et al., 1988). This support includes emotional encouragement, practical help, academic guidance and a sense of belonging through meaningful social interactions in the online learning environment. Adequate emotional and social support helps students to cope better with academic demands, to diminish feelings of isolation and stress, and to foster resilience, psychological well-being, and academic success. Conversely, limited support can increase students' susceptibility to stress and anxiety, especially during extended periods of online learning (Cobo-Rendón et al., 2020; Browning et al., 2021).

Mental Health

The World Health Organization (WHO) (2022) defines mental health as a state of psychological wellbeing where one is able to perform efficiently, learn effectively, live productively and contribute to their community. It includes emotional, psychological and social health and well-being; these impact on people's thoughts, feelings and behaviours in everyday life. Mental well-being is crucial in higher education as it enhances students' motivation and focus, assists them in managing academic pressures, and allows them to successfully complete their educational tasks.

In the past few years, universities students have been found to be a vulnerable category for mental health issues,

particularly with respect to online learning settings. During the COVID-19 pandemic, many students had greater psychological distress due to the movement of education to a virtual environment and the lack of in-person social interaction and academic schedules (Son et al., 2020). Likewise, Browning et al. (2021) concluded that greater academic uncertainty, reduced social interaction, financial concerns, and a change in learning environments were significant factors in increased mental health distress among college students. In addition, a systematic review by Pascoe et al. (2020) found that chronic academic stress has a negative effect on student mental health, academic achievement and overall psychological functioning. The discovery suggests there is flexibility and accessibility in online learning, but it also can make students vulnerable to psychological problems that can negatively impact mental health.

In this study, mental health is the dependent variable operationalized in two dimensions: stress and anxiety. These dimensions are frequently used in higher education research to evaluate students' psychological well-being since they reflect typical emotional responses to academic and environmental stressors (Lovibond & Lovibond, 1995). Higher levels of stress and anxiety indicate poorer mental health and reduced capacity to cope with the demands of online learning. Therefore, the study explores stress and anxiety to understand on the factors of online learning that influence the mental health of UiTM students.

Stress is a psychological and physiological reaction that occurs when a person perceives that the demands of their environment or their academic demands exceed their ability to cope effectively (American Psychological Association, 2023). Stress in the online learning environment may arise from the excessive academic workload, multiple assessments, unstable internet connectivity, adjustment to digital learning platforms, and the need to balance academic and personal responsibilities. Academic stress over a long period of time can lead to a decrease in students' ability to focus, motivation, grades, and mental health (Pascoe et al., 2020). The heavy academic workload, multiple assignments, frequent assessments, time pressure, unstable internet connectivity and the need to adjust to digital learning platforms often make online learning stressful for students. If these demands continue, they may affect students' concentration, motivation and academic engagement. Earlier studies have reported academic demands and technological challenges as key stressors of university students participating in online learning (Aristovnik et al., 2020; Browning et al., 2021).

Anxiety is defined as a state of persistent feelings of worry, nervousness or fear resulting from uncertainty or perceived threats and may interfere with a person's daily functioning (American Psychological Association, 2023). Some reasons you might be anxious about online learning are: worrying about doing well in school, not having a good internet connection, not knowing how to use new learning tools, having trouble talking with teachers, not knowing if you can do what the course wants you to do. Research has found that students engaged in online learning have experienced increased anxiety due to academic uncertainty, technical issues, and social isolation (Son et al., 2020; Browning et al., 2021). Unlike temporary stress, anxiety can last long after the immediate challenge is gone, and it can impact students' ability to focus, make decisions, stay motivated to learn and succeed academically. It has been shown by research that students who participated in online learning during and after the COVID-19 pandemic experienced increased levels of anxiety due to academic uncertainty, social isolation, and technological challenges (Aucejo et al., 2020; Browning et al., 2021).

Stress and anxiety are closely linked and often go hand in hand. Long term exposure to academic pressure may lead to chronic anxiety if there are not enough coping resources or support leading to poor mental health outcomes. Hence, this study uses stress and anxiety as the main indicators of mental health to examine the effects of online learning factors on the psychological well-being of UiTM students.

Online Learning And Mental Health

The rapid move to online learning has transformed higher education, providing greater flexibility and access. But it also brought new problems that could affect on the mental health of students. Online learning factors such as academic workload, internet connectivity, learning environment, time management, and emotional and social support have been shown to be significant factors in the psychological well-being of students (Aristovnik et al., 2020; Son et al., 2020). Depending on the learning conditions and the availability of adequate support, these

factors may increase or decrease the levels of students' stress and anxiety.

Among these factors, academic workload is one of the strongest predictors of students' psychological distress. High workload, multiple assessments and several deadlines for assignments, especially in an online environment where students need to manage their learning independently, are often responsible for increased stress levels of students (Aucejo et al., 2020; Browning et al., 2021). When students perceive that their academic demands surpass the time and coping resources available to them, they are more likely to experience stress, anxiety, and emotional exhaustion. Conversely, students who are provided with reasonable workloads and feasible deadlines are more capable of balancing their academic and personal commitments and thus experience better mental health.

Another important aspect of students' online learning experiences is Internet connectivity. Students can join the class, download the learning material, submit assignments and communicate with the lecturers and classmates with a reliable internet. By contrast, learning is frequently interrupted by unstable Internet connections, and student confidence and satisfaction in learning can become low, particularly in rural and underserved communities, due to the associated frustration, uncertainty, and anxiety (Aristovnik et al., 2020; Subramaniam et al., 2024). This technological barrier may have an impact on reducing the students' confidence and causing mental distress when learning.

To add, another key factor is the learning environment. Generally, a quiet, comfortable, well-resourced place to study assists students in focusing and remaining involved in online learning. Conversely, if the home environment is noisy, there is a lack of study space, poor learning facilities and continuous distractions during study, it will affect the effectiveness of learning and emotional stress (Heo et al., 2021). Enabling learning environments not only lead to improved academic achievement, but they may also have a positive impact on psychological wellness.

Likewise, managing time is crucial to effective online learning. Unlike the classroom environment, students must manage their own learning times, schedule their educational priorities, and manage their learning and personal needs in an online setting. Good time management skills also help students to be better equipped to manage with academic demands and have lower levels of stress and anxiety than those students who are unable to manage their learning activities (Pascoe et al., 2020).

Emotional and social support also plays an important role as a protective factor for students' mental health. Support from family members, friends, lecturers and peers can alleviate the sense of isolation, offer encouragement during tough times and enhance the students' ability to cope with academic challenges. Students with greater perceptions of emotional and social support tend to report lower levels of stress and anxiety and better psychological well-being than students who lack support networks (Cobo-Rendón et al., 2020; Son et al., 2020).

In general, prior research consistently shows a significant association between online learning factors and students' mental health. University students experienced increased psychological distress during the COVID-19 pandemic due to academic pressure, technological challenges, social isolation, and changes in their learning environments (Aristovnik et al., 2020; Browning et al., 2021; Son et al., 2020). While online learning provides flexibility, accessibility, and the potential for self-paced learning, its advantages are largely contingent upon the presence of sufficient technological resources, effective learning strategies, supportive learning environments, and robust social support systems. Thus, enhancing these online learning factors can contribute to alleviating students' stress and anxiety and fostering better mental health. Based on these findings, this study proposes that academic workload, internet connectivity, learning environment, time management and emotional and social support are significant factors influencing the mental health of UiTM students.

Theoretical Foundation

This study is based on two complementary theories: the Transactional Theory of Stress and Coping (TTSC) developed by Lazarus and Folkman (1984) and the General Adaptation Syndrome (GAS) proposed by Selye

(1956). These theories together explain how students respond to stressors in an online learning environment and how long-term exposure to these stressors can affect their mental health.

The Transactional Theory of Stress and Coping suggests that stress depends not only on external events but also on how people evaluate or appraise those events and the coping resources they can use to deal with them (Lazarus & Folkman, 1984). General Adaptation Syndrome, in contrast, describes the psychological and physiological reactions that occur when individuals are exposed to stress over a long time (Selye, 1956). TTSC deals with stress appraisal and coping, whereas GAS deals with the effects of chronic stress. Thus, these theories are complementary in their explanations of the effect of online learning factors on students' stress and anxiety.

Transactional Theory of Stress and Coping (TTSC)

The Transactional Theory of Stress and Coping (TTSC) proposed by Lazarus and Folkman (1984) posits that stress occurs when people perceive environmental demands to be beyond their available resources to cope. According to the theory, stress is not caused by stressful situations themselves, but by the way individuals cognitively appraise stressful situations.

The theory includes two appraisal processes. Primary appraisal is when the individual evaluates the situation as irrelevant, beneficial or harmful. Secondary appraisal is the assessment of the resources to deal with the situation. More likely to experience psychological distress are individuals who believe that their coping resources are inadequate.

In an online learning context, students constantly assess a range of academic and environmental demands such as academics workload, internet connectivity, learning environment, time management and emotional and social support. For example, students who perceive heavy academic workloads or unstable internet connections as beyond their ability to cope are more likely to experience stress and anxiety. In contrast, students who have good time management skills, a supportive learning environment, and strong emotional support may consider the same challenges as manageable and therefore experience less psychological distress.

The theory further accounts for the variance in mental health outcomes among students who are exposed to similar online learning environments. Individual differences in coping methods, available resources, resilience, and social support affect how students react to online learning challenges. Thus, TTSC provides a suitable theoretical explanation of the relationship between online learning factors and students' mental health.

General Adaptation Syndrome (GAS)

The General Adaptation Syndrome (GAS), introduced by Selye (1956), explains how individuals respond when stress continues over time. Unlike TTSC, which focuses on stress appraisal and coping, GAS describes the stages of psychological and physiological adaptation to prolonged stress.

- **Alarm Stage**: The alarm stage is the body's first response to a stressor (Selye, 1956). At this point, students may experience shock, confusion, anxiety and uncertainty when confronted with abrupt changes such as the transition from face-to-face to online learning (Madazimova et al., 2023). They might find it difficult to adjust to new learning technologies, new methods of instruction, and higher academic standards.
- **Resistance Stage**: During the resistance stage, students try to cope with ongoing stress by modifying their behaviours and developing coping methods. They may improve their time management, become familiar with online learning platforms, seek help from lecturers and peers, and develop more effective study routines (Theresia, 2022). Students still experience stress, but can still fulfill their academic responsibilities if they have enough support.
- **Exhaustion Stage**: The exhaustion stage is when the stress persists for a long time without enough recovery or support (Selye, 1956). At this stage, students' coping resources are depleted, which results in emotional exhaustion, burnout, chronic stress, anxiety, decreased motivation and poorer academic results

(Madazimova et al., 2023). Prolonged exposure to online learning stressors without appropriate interventions may significantly impair students' mental health.

Relevance of TTSC and GAS to the Present Study

The theoretical background of the present study complements with the theories of Transactional Theory of Stress and Coping and the General Adaptation Syndrome. The TTSC is based on the cognitive appraisal of the stressor factors for online learning (academic workload, internet access, learning environment, time management, emotional and social support), and the appraisal that affects the students' stress reactions. GAS goes on to describe this explanation with a discussion of how prolonged exposure to these stressors can impact students' mental health over time if they do not have appropriate coping resources and support.

Combined, these theories help account for how students in comparable online learning situations might experience differing levels of stress and anxiety and the negative mental health impacts from extended periods of online learning. Therefore, TTSC and GAS provide a comprehensive theoretical background that can be used to study the relationship between factors of online learning and mental health of UiTM students. Figure 1 show the conceptual framework of this study. The following are the hypotheses of this study:

H1: Academic workload has a significant relationship with students' mental health.

H2: Internet connectivity has a significant relationship with students' mental health.

H3: Learning environment has a significant relationship with students' mental health.

H4: Time management has a significant relationship with students' mental health.

H5: Emotional and social support has a significant relationship with students' mental health.

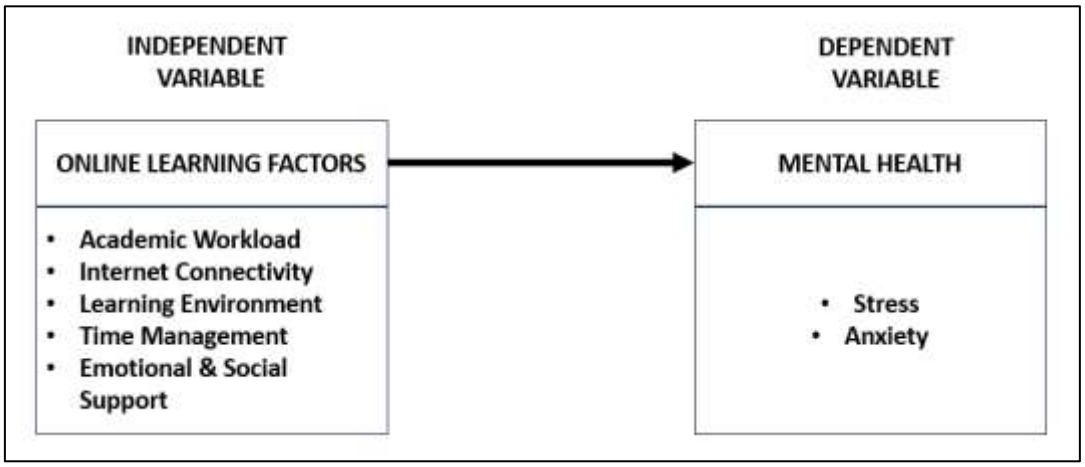

Figure 1: Conceptual Framework of the Study

PROPOSED METHODOLOGY

This study uses a cross-sectional quantitative research design to analyze the correlation between online learning factors and mental health of UiTM undergraduate students. A quantitative approach is suitable since it allows for the collection of numerical data and statistical analysis of the proposed independent and dependent variables. The proposed empirical procedures for the validation of the conceptual framework are presented in this paper.

The target population are the UiTM undergraduate students who had the experience of online learning. Since the study is directed to students who have prior experiences in online learning, convenience sampling will be used to get respondents who will meet the criteria of the study and willing to participate. Convenience sampling might

reduce the generalisability of the results but as this is a preliminary investigation, it is deemed adequate for this study given its practicality and accessibility at various UiTM campuses. The number of samples will be based on Hair et al. (2022) recommendations for multivariate analysis.

Data will be gathered by using an online questionnaire which will be administered through Google Forms. The questionnaire will be evaluated with the help of experts before the actual data collection to ensure its content validity. A pilot study will then be carried out to help determine clarity of the items on the questionnaire and the degree of instrument reliability. The structured questionnaire will be based on five-point Likert scale ranging from 1 to 5. The use of the online survey method is suitable because it enables respondents to fill out the questionnaire with ease and without requiring a lot of time or money to collect the data from various campuses of UiTM. All respondents will be informed about the study and give their informed consent before data collection. The confidentiality and anonymity of the participants will be ensured in the entire study.

The independent variables in this study are online learning factors which are academic workload, internet connectivity, learning environment, time management, and emotional and social support. The dependent variable is mental health and will be quantified in two psychological outcome measures: stress and anxiety. The items in the questionnaire will be modified from those previously validated in the literature. The content validity of the instrument will be determined by expert opinion and the internal consistency reliability by Cronbach's alpha coefficient. The Cronbach's alpha coefficient of 0.70 or above will be acceptable (Hair et al., 2022).

The collected data will be analysed by the Statistical Package for the Social Sciences 29th version. The data collected will be checked for missing values, normality and outlier values and then the statistical analysis will be done. Demographic data on the respondents and the study variables will be described in terms of frequencies, percentages, means and standard deviations. Next, Pearson correlation analysis will be used to analyse the relationships between the variables. Multiple linear regression analysis will then be used to find the effect of academic workload, internet connection, learning environment, time management, emotional and social support on students' mental health. The 0.05 significance level will be used to assess the statistical significance.

Expected Contribution

The findings of this study are anticipated to contribute to theory and practice by extending the knowledge of the mental health of the university students regarding various factors of online learning. The results would be useful for using the Transactional Theory of Stress and Coping and the General Adaptation Syndrome (GAS) theory in the context of online learning in higher education. To gain a comprehensive picture of the relationship between academic workload, internet connection, learning environment, time management, emotional and social support and stress and anxiety experienced by students with online education, this study simultaneously investigated these variables.

The findings can be advantageous for the higher education institutions, in this case, Universiti Teknologi MARA (UiTM) in order to create strategies to enhance the online learning environment for the students which will also help to protect their mental well-being. The results can support the university management, academic and policy makers for developing relevant interventions like enhancing digital infrastructure, checking the academic workload, improving student support services, and fostering effective time management and emotional support programmes. Such activities can contribute to a better learning atmosphere and students' academic and mental health.

LIMITATIONS AND FUTURE RESEARCH

This study is a conceptual study and doesn't rely on any empirical evidence. Hence, the proposed relationships between the variables should be tested through quantitative or mixed methods research design. Besides, this framework is specifically designed for students of uitm only, and may not reflect the students from other higher educational institutions that have different demographic and institutional characteristics. The proposed model also includes five factors of online learning but other factors that may affect students' mental health, such as

digital literacy, self-regulated learning, resilience, psychological capital, and socioeconomic status, are not considered. Future research should test the proposed framework with larger and more varied samples and investigate possible mediating and/or moderating variables that could enhance the understanding of the relationship between online learning factors and students' mental health. Future research may also investigate the mediating role of coping strategies and the moderating effects of psychological capital, resilience, or digital literacy to provide a more comprehensive understanding of students' mental health in online learning environments.

CONCLUSION

Online learning has transformed the higher education market and presents opportunities and challenges for university students. The advantages of online learning are flexibility and increased access; however, the disadvantages could include mental health issues due to academic, technological, environmental and social challenges. This concept paper outlines a framework to explore the relationship between the factors of online learning and mental health of UiTM students using the Transactional Theory of Stress and Coping and General Adaptation Syndrome (GAS).

The proposed study will make important contributions to the literature because it will combine many of the factors of online learning together in one conceptual framework and study the impact these factors will have on stress and anxiety of students. The results will provide valuable information for developing better online learning and Student Support Strategies in higher education. Ultimately, the study aims to contribute towards the advancement of a more motivating and psychologically healthy online learning environment to boost students' academic performance and overall welfare.

REFERENCES

1. Agormedah, E. K., Henaku, E. A., Ayite, D. M. K., & Ansah, E. A. (2020). Online learning in higher education during COVID-19 pandemic: A case of Ghana. Journal of Educational Technology and Online Learning, 3(3), 183-210.
2. American Psychological Association. (2023). APA dictionary of psychology: Anxiety. https://dictionary.apa.org/anxiety
3. American Psychological Association. (2023). APA dictionary of psychology: Stress. https://dictionary.apa.org/stress
4. Aristovnik, A., Keržič, D., Ravšelj, D., Tomaževič, N., & Umek, L. (2020). Impacts of the COVID-19 pandemic on life of higher education students: A global perspective. Sustainability, 12(20), 8438. https://doi.org/10.3390/su12208438
5. Aucejo, E. M., French, J., Araya, M. P. U., & Zafar, B. (2020). The impact of COVID-19 on student experiences and expectations: Evidence from a survey. Journal of Public Economics, 191, 104271. https://doi.org/10.1016/j.jpubeco.2020.104271
6. Browning, M. H. E. M., Larson, L. R., Sharaievska, I., Rigolon, A., McAnirlin, O., Mullenbach, L., Cloutier, S., Vu, T. M., Thomsen, J., Reigner, N., Metcalf, E. C., D'Antonio, A., Helbich, M., Bratman, G. N., & Alvarez, H. O. (2021). Psychological impacts from COVID-19 among university students: Risk factors across seven U.S. states. PLoS ONE, 16(1), e0245327. https://doi.org/10.1371/journal.pone.0245327
7. Cao, T., Zhang, Z., Chen, W., & Shu, J. (2023). Utilizing clickstream data to reveal the time management of self-regulated learning in a higher education online learning environment. Interactive Learning Environments, 31(10), 6555–6572.
8. Cleveland-Innes, M., & Campbell, P. (2012). Emotional presence, learning, and the online learning environment. International Review of Research in Open and Distributed Learning, 13(4), 269–292. https://doi.org/10.19173/irrodl.v13i4.1234
9. Cobo-Rendón, R., Pérez-Villalobos, M. V., Páez-Rovira, D., & Gracia-Leiva, M. (2020). A longitudinal study: Affective well-being, psychological well-being, self-efficacy and academic performance among first-year undergraduate students. Scandinavian Journal of Psychology, 61(4), 518–526.

10. Hair, J. F., Jr., Black, W. C., Babin, B. J., & Anderson, R. E. (2022). *Multivariate data analysis* (8th ed.). Cengage Learning.
11. Heo, H., Bonk, C. J., & Doo, M. Y. (2021). Enhancing learning engagement during COVID-19 pandemic: Self-efficacy in time management, technology use, and online learning environments. Journal of Computer Assisted Learning, 37(6). https://doi.org/10.1111/jcal.12603
12. Ismail, N. S., Abu Bakar, N. M., & Wafa, S. W. S. (2020). Online learning challenges during pandemic COVID-19 in Malaysian higher learning institutions. Universal Journal of Educational Research, 8(12), 7151–7159. http://www.hrpub.org/download/20201130/UJER82-19591512.pdf
13. Kristiana, I. F., Prihatsanti, U., Simanjuntak, E., & Widayanti, C. G. (2023). Online Student Engagement: The Overview of HE in Indonesia. The International Review of Research in Open and Distributed Learning, 24(3), 34–53. https://doi.org/10.19173/irrodl.v24i3.7125
14. Lazarus, R. S., & Folkman, S. (1984). Stress, appraisal, and coping. Springer.
15. Lovibond, P. F., & Lovibond, S. H. (1995). Manual for the Depression Anxiety Stress Scales (2nd ed.). Psychology Foundation.
16. Madazimova, K. T., Mambetalina, A. S., & Isatayeva, B. B. (2023). Stress as a psychological phenomenon.
17. Martin, F., & Bolliger, D. U. (2018). Engagement matters: Student perceptions on the importance of engagement strategies in the online learning environment. Online Learning, 22(1), 205–222.
18. Mou, T.-Y. (2023). Online learning in the time of the COVID-19 crisis: Implications for the self-regulated learning of university design students. Active Learning in Higher Education, 24(2), 185–205.
19. Ndibalema, P. (2022). Constraints of transition to online distance learning in Higher Education Institutions during COVID-19 in developing countries: A systematic review. E-Learning and Digital Media, 19(6), 204275302211075. https://doi.org/10.1177/20427530221107510
20. Pascoe, M. C., Hetrick, S. E., & Parker, A. G. (2020). The impact of stress on students in secondary school and higher education. International Journal of Adolescence and Youth, 25(1), 104–112. https://doi.org/10.1080/02673843.2019.1596823
21. Selye, H. (1956). The stress of life. McGraw-Hill.
22. Son, C., Hegde, S., Smith, A., Wang, X., & Sasangohar, F. (2020). Effects of COVID-19 on college students' mental health in the United States: Interview survey study. Journal of Medical Internet Research, 22(9), e21279. https://doi.org/10.2196/21279
23. Subramaniam, L., Yap, C. S., Jalaludin, F. W., & Hen, K. W. (2024). Digital Divide and University Students' Online Learning amidst Covid-19 Pandemic in Malaysia. Libri, 74(2), 197–210. https://doi.org/10.1515/libri-2023-0115
24. Theresia, L. (2022). The relationship between challenges e-learning and interaction with motivation and satisfaction amongst student during covid-19 pandemic.. https://doi.org/10.46254/af03.20220160
25. Topală, I.-R., Necșoi, D.-V., Cazan, A.-M., & Stan, M.-M. (2025). Sources of stress in online learning scale: Development and validation of an instrument to evaluate students' stressors associated with online learning. Frontiers in Psychology, 16, 1556824. https://doi.org/10.3389/fpsyg.2025.1556824
26. Thandevaraj, E. J., Gani, N. A. N., & Nasir, M. K. M. (2021). A review of psychological impact on students' online learning during COVID-19 in Malaysia. Creative Education, 12(6), 1296–1306. https://doi.org/10.4236/ce.2021.126097
27. United Nations Educational, Scientific and Cultural Organization. (2023). Global education monitoring report 2023: Technology in education—A tool on whose terms? UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000385723
28. World Health Organization. (2022). Mental health: Strengthening our response. https://www.who.int/news-room/fact-sheets/detail/mental-health-strengthening-our-response
29. Yangdon, K., Sherab, K., Choezom, P., Passang, S., & Deki, S. (2021). Well-being and academic workload: Perceptions of science and technology students. Educational Research and Reviews, 16(11), 418–427. https://doi.org/10.5897/ERR2021.4197
30. Zimet, G. D., Dahlem, N. W., Zimet, S. G., & Farley, G. K. (1988). The Multidimensional Scale of Perceived Social Support. Journal of Personality Assessment, 52(1), 30–41. https://doi.org/10.1207/s15327752jpa5201_2