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Determinants of Academic Burnout: Examining Digital and Psychological Factors among University Students

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ABSTRACT

This study examines the determinants of academic burnout among university students in blended learning environments, specifically investigating how digital deprivation, cognitive overload, digital aging, emotional exhaustion, and perceived learning support directly influence academic burnout. A quantitative approach was used, collecting survey data from 166 university students in Malaysia. Data were analyzed using SPSS software. The findings reveal that cognitive overload has a significant positive effect on academic burnout ($\beta = 0.226$, $p < 0.01$), while perceived learning support unexpectedly showed a significant positive effect ($\beta = 0.166$, $p < 0.05$). Digital deprivation, digital aging, and emotional exhaustion did not have significant effects on academic burnout. This study confirms that cognitive overload is a critical determinant of academic burnout in blended learning settings. The results provide practical implications for educators and institutions to design supportive learning environments that reduce student burnout and improve well being

Keywords: Academic Burnout; Blended Learning; Digital Deprivation; Cognitive Overload; Digital Aging; Emotional Exhaustion; Perceived Learning Support

INTRODUCTION

Blended learning have become very common in higher education institutions around the world. According to Fung et al. (2023) higher education institutions moved to online mode because of movement restrictions during the COVID-19 pandemic and after the restrictions ended blended and hybrid learning still remained important for post pandemic education. According to Abdullah et al. (2022) university students in Malaysia showed different levels of satisfaction and future views towards remote learning and many students preferred a blended approach that combines online and face to face learning. According to Kee et al. (2021) factors affecting sleep quality such as lifestyle behavior and environment are important for students overall well being which also affects their academic performance and burnout levels. According to Demerouti, (2025) job demands and job resources strongly affect stress levels among employees and this is similar to how academic demands and resources affect student burnout in higher education settings.

However the transition to blended learning has created major challenges related to students psychological well being and academic performance. According to Messina et al. (2024) academic burnout is a condition marked by exhaustion cynicism distant attitudes toward studying and lower self efficacy in academic activities. According to Müller and Mildenberger (2021) the constant switching between physical and digital spaces in blended learning increases these symptoms and causes chronic fatigue and disengagement among university students. According to Munir et al. (2021) students fear of COVID 19 and the sudden move to online learning created psychological distress which reduced social presence and engagement in online learning environments. According to Fozeli et al. (2022) during the global pandemic e learning became more popular and important and students who experienced convenience and flexibility in online learning reported higher satisfaction and better learning experiences.

Despite the benefits of blended learning most existing research focused on traditional classroom settings or fully online learning. There is still a lack of understanding about how specific digital and psychological factors contribute to academic burnout in blended environments. Most previous studies only examined one or two factors such as internet connectivity or workload. The combined direct effects of digital deprivation cognitive overload digital aging emotional exhaustion and perceived learning support on academic burnout have not been fully examined. According to Anwar et al. (2022) the impact of COVID 19 social media news on employee behavior showed that psychological well being and depression mediate the relationship between external stressors and work related outcomes which highlights the importance of understanding how digital stressors affect student burnout in education.

This study is guided by a conceptual framework that suggests direct relationships between five independent variables and one dependent variable. According to Kee et al. (2022) acculturative stress among international students in Malaysian universities is strongly affected by culture shock language barriers and fear. In the same way students in blended learning environments experience digital related stressors that contribute to academic burnout. First according to van Deursen and van Dijk (2022) digital deprivation refers to the lack of proper access to digital devices and stable internet connection. Students facing digital deprivation struggle to join online learning activities which increases stress and burnout. Second according to Marzolla et al. (2025) cognitive overload happens when the amount of information is more than a person can process. In high tech learning environments cognitive load demands can cause sensory overload and fatigue which directly relate to mental exhaustion and lower academic performance. Third according to Nimrod (2022) digital aging refers to the feeling that digital tools are becoming more complex and tiring to keep up with. This phenomenon is linked to

technostress and directly predicts higher disengagement among students who feel overwhelmed by constant digital updates. Fourth according to Cuevas Caravaca et al. (2025) emotional exhaustion is a core dimension of burnout marked by feeling emotionally overextended and emotionally drained. Students in blended learning settings with high emotional exhaustion show a significant increase in academic burnout scores. Fifth according to Young Jones et al. (2022) perceived learning support refers to students perceptions about the availability and quality of support provided by their educational institution. Students who feel strong institutional and instructor support report lower levels of academic burnout compared to students who feel isolated.

The objectives of this study are to examine the direct effect of digital deprivation on academic burnout to examine the direct effect of cognitive overload on academic burnout to examine the direct effect of digital aging on academic burnout to examine the direct effect of emotional exhaustion on academic burnout and to examine the direct effect of perceived learning support on academic burnout among university students in blended learning environments.

This study contributes theoretically by extending the Job Demands Resources Model to the blended learning burnout context. According to Teoh et al. (2021) the Job Demands Resources Model effectively explains how job demands and job resources affect stress levels and this framework is also suitable for understanding how academic demands and support resources influence student burnout. Practically the findings give useful insights for university administrators and educators to create interventions that reduce digital stressors and improve learning support. According to Fozeli et al. (2022) students who experience convenience flexibility and positive learning experiences are more satisfied with their education which suggests that improving the quality of blended learning environments can reduce burnout and improve student well being. The novelty of this study is examining five determinants together in one framework focusing on direct relationships within the Malaysian higher education context.

LITERATURE REVIEW

Digital Deprivation

According to Zhao et al. (2025) digital deprivation has a significant positive effect on academic burnout because limited access to digital resources increases academic stress disengagement and emotional exhaustion among students In digitally dependent learning environments lack of reliable internet devices or online platforms disrupts academic continuity and creates pressure to cope with missed content and deadlines According to Liu et al. (2023) these barriers reduce students perceived competence and control over learning which are key predictors of burnout According to Varallo et al. (2026) students with poor digital access reported higher stress anxiety and academic fatigue According to Nasution and Isnayanti (2025) the digital divide increases inequalities that worsen academic pressure . Unequal access to technology leads to cumulative disadvantages which directly contribute to emotional exhaustion Furthermore according to Self-Determination Theory unmet needs for competence autonomy and relatedness caused by limited digital participation result in lower motivation and higher burnout According to Zhao et al. (2025) empirical evidence confirms that limited access to online learning resources is positively associated with higher levels of academic burnout Therefore the literature supports the hypothesis that greater digital deprivation leads to higher academic burnout making it an important factor in understanding students psychological and academic challenges

H1: Digital deprivation has a positive effect on academic burnout.

Cognitive Overload

According to Alho et al. (2022), media multitasking and excessive screen time from phones, laptops, tablets and other digital devices can negatively affect cognitive functions in adolescents and young adults. According to Amez et al. (2021), prolonged smartphone use and continuously looking down at screens can cause repetitive strain on the neck and jawline leading to physical discomfort and tech neck which may contribute to mental fatigue. prolonged video mediated interactions such as Zoom require students to consciously process non verbal cues that would normally be understood automatically in face to face communication resulting in non verbal overload. According to Alruthaya et al. (2021), the fast changing technological world where digital skills can quickly become outdated creates a catch up curve that can make students feel disconnected and overwhelmed. According to Liu et al. (2022), excessive smartphone use is associated with academic procrastination and poor time management which can increase the risk of academic burnout. platform induced mindlessness caused by algorithmic personalization and media multitasking reduces attentional control, academic performance and emotional resilience. These factors related to digital aging or tech aging can lead to early cognitive fatigue from prolonged digital screen use and eventually contribute to academic burnout

H2: Cognitive overload has a positive effect on academic burnout.

Digital Aging

According to Nimrod (2025), digital aging refers to the feeling that digital tools are becoming increasingly complex and exhausting to keep up with, which is often linked to technostress. According to Amez et al. (2021), prolonged smartphone use and continuously looking down at screens causes repetitive strain on the neck and jawline, leading to physical discomfort and tech neck which can contribute to mental fatigue. According to the scientific report on EFL learners (2026), excessive screen time from phones, laptops, tablets and other digital devices can lead to eye strain, dry eyes, and headaches, which accumulate over time and reduce students' ability to concentrate on academic tasks. According to Alho et al. (2022), the fast-changing technological world where digital skills can quickly become outdated creates a catch-up curve that can make students feel disconnected and overwhelmed. According to Sheikh and Khriam (2026), the constant pressure to keep up with new digital platforms and updates creates technostress, which directly contributes to feelings of exhaustion and disengagement from academic work. All these factors linked to digital aging result in early cognitive fatigue due to prolonged use of digital screens and ultimately contribute to academic burnout.

H3: Digital aging has a positive effect on academic burnout.

Emotional Exhaustion

Emotional exhaustion refers to a psychological condition where individuals feel emotionally drained mentally fatigued and lacking internal energy because of long term stress and excessive demands According to the meta analysis by Jahanaray et al. (2026) emotional exhaustion is one of the main dimensions of burnout and has a stronger relationship with psychological distress compared to other burnout dimensions In higher education university students experience emotional exhaustion because of academic workload examination pressure assignment deadlines financial stress and difficulty balancing personal life with academic responsibilities According to Yang et al. (2022) teacher emotional support helps reduce learning burnout and students who receive higher support experience lower emotional exhaustion According to the burnout meta analysis the relationship between burnout and psychological distress was higher during the pandemic compared to before the pandemic According to the dual pathways study exhaustion is usually the earliest sign of burnout because it shows the reduction of emotional and psychological resources caused by continuous stress that prevents personal growth According to Yang et al. (2022) students with emotional exhaustion have

difficulty focusing maintaining motivation and staying interested in learning activities According to the scientific report on EFL learners (2026) digital stressors such as technostress and digital fatigue increase foreign language anxiety which then worsens digital burnout Therefore when students feel that their emotional resources are not enough to meet academic expectations emotional exhaustion increases and leads to academic burnout

H4: Emotional Exhaustion support has a positive effect on academic burnout.

Perceived Learning Support

ccording to Kee et al. (2021), perceived learning support refers to students' views about the availability and quality of help provided by instructors and educational institutions. The authors stated that support from the academic community can help reduce academic stress among university students. Rubel et al. (2021) found that perceived organizational support helps improve work outcomes. This idea can also be applied to education where support can improve students' academic engagement and well-being. According to Kee and Chung (2021), perceptions of organizational justice and support have a significant effect on job satisfaction and organizational commitment. In educational settings, students who feel fairly treated and supported by their institutions are more satisfied and experience lower levels of academic burnout. Rubel et al. (2023) reported that quality of work life and perceived support are positively related to positive outcomes. Similarly, students who receive strong learning support tend to achieve better academic results and experience less burnout.Kee and Cordova (2025) stated that support is important when adapting to new technology and learning environments. Students who receive adequate support during the transition to blended learning can better manage digital learning demands and are less likely to experience academic burnout.Based on the theories and previous studies discussed above, students who perceive higher levels of learning support are less likely to experience academic burnout. Therefore, we hypothesize:

H5: Perceived learning support has a negative effect on academic burnout.

Conceptual Framework

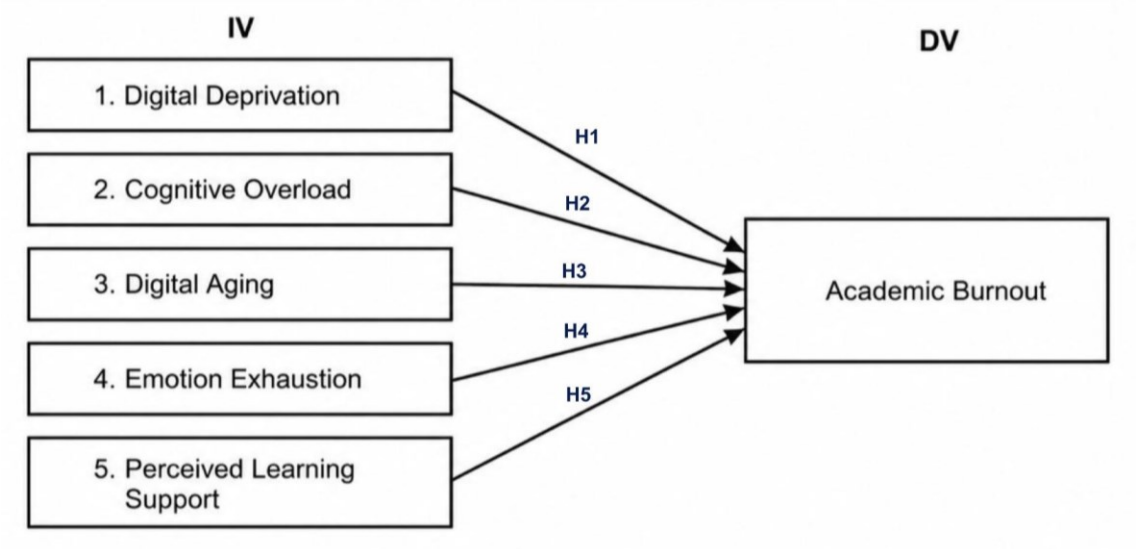


Figure 1. Research Framework

RESEARCH METHOD

Sampling

In this study, we focused on university students in Malaysia who are currently learning through a "blended" approach a mix of online and face-to-face classes. We chose this group as our "unit of analysis" because they are right at the center of the transition between physical and digital classrooms, making them the best group to help us understand how digital stress and burnout happen.

We used a method called convenience sampling to reach out to as many students as possible. The participants in our study come from various backgrounds, including those who have great internet access and those who face "digital deprivation," such as having a slow connection or a lack of proper devices. By looking at students across different years of study, we were able to get a broad picture of how factors like cognitive overload and emotional exhaustion affect their daily lives.

Data Collection

We gathered our information by using an online survey. This was the most effective way to reach students who are already using digital platforms for their education. The survey was kept short and straightforward so that students could finish it in about 10 to 15 minutes without feeling overwhelmed.

Before anyone started the survey, we made sure they understood that their participation was completely voluntary and that their answers would stay private. We didn't collect names, which helped students feel comfortable being honest about their stress levels and the support they get from their teachers. After the survey period ended, we used SPSS software to analyze the numbers and see if our theories were correct.

Measures

To make sure our results were accurate, we used sets of questions that have been tested and proven by other researchers in the past. To measure "digital deprivation," we asked students about their access to reliable Wi-Fi and computers. For "cognitive overload," we looked at how difficult it is for them to jump between different learning apps and handle a heavy digital workload.

We also measured the psychological side of things. For "emotional exhaustion," we asked students if they felt drained or "used up" by their studies. To understand "perceived learning support," we asked them if they felt their instructors were there for them when things got tough. Finally, all of these answers were compared to their "academic burnout" levels to see which factors had the biggest impact.

RESULTS

Table 1. Summary of Respondents' Demographic (N=166)

Response	Frequency	Percentage (%)
Age		
18–21	75	45.2
22–25	53	31.9
26–30	23	13.9
31 and above	15	9.0
Gender		
Male	63	38.0
Female	71	42.8
Prefer not to say	32	19.3
Education Level		

Diploma	46	27.7
Bachelor's degree	57	34.3
Master's degree	30	18.1
PhD	33	19.9
Current Year of Study		
Postgraduate	9	5.4
Year 1	40	24.1
Year 2	62	37.3
Year 3	34	20.5
Year 4	21	12.7

Note: The total number of respondents in this study was 166.

Table 1 presents the demographic characteristics of the 166 respondents involved in this study. Based on the age distribution the majority of respondents were aged between 18–21 years old (N=75, 45.2%), followed by those aged 22–25 years (N=53, 31.9%). Respondents aged 26–30 years represented 13.9% (N=23), while respondents aged 31 years and above formed the smallest group with 9.0% (N=15).

In terms of gender distribution, female respondents represented the highest percentage with 42.8% (N=71) followed by male respondents at 38.0% (N=63). Meanwhile, 19.3% (N=32) of respondents preferred not to disclose their gender.

Regarding education level, most respondents possessed a Bachelor's degree (N=57, 34.3%), followed by Diploma holders (N=46, 27.7%). Respondents with a PhD accounted for 19.9% (N=33) while Master's degree holders represented 18.1% (N=30).

For the current year of study, the majority of respondents were Year 2 students (N=62, 37.3%). This was followed by Year 1 students (N=40, 24.1%) and Year 3 students (N=34, 20.5%). Year 4 students represented 12.7% (N=21), while postgraduate students formed the smallest category with 5.4% (N=9).

Table 2 *Descriptive Statistics, Cronbach's Alpha Reliability Coefficients, and Zero-order Correlations for All Study Variables*

Variables	**1**	**2**	**3**	**4**	**5**	**6**
Digital Deprivation	.246					
Cognitive Overload	.072	.152				
Digital Aging	.051	.061	.035			
Emotional Exhaustion	-0.033	.164*	.075	.166		
Perceived Learning Support	-0.012	.063	.119	.060	.173	
Academic Burnout	.006	.263**	.173*	..177*	.203**	.258
Mean	2.456	2.937	2.990	3.154	3.345	3.021

SD	0.719	0. 683	0.657	0.729	0.679	0.738

Note: N = 166; *p < .05, ***p < .01. The bold diagonal entries represent Cronbach's Coefficient Alpha. Cronbach's alpha values for each scale are presented on the diagonal.*

Table 2 presents descriptive statistics, measures of reliability, and zero-order correlations among all study variables. The mean scores for the variables ranged from 2.456 to 3.345. Perceived Learning Support had the highest mean (M = 3.345, SD = 0.679), while Digital Deprivation had the lowest mean (M = 2.456, SD = 0.719). Academic Burnout had a mean score of 3.021 (SD = 0.738).

The reliability of each measurement scale was assessed using Cronbach's alpha coefficients, displayed along the diagonal of Table 2. The coefficients ranged from 0.035 to 0.258. The zero-order correlations among the variables revealed several significant relationships. Academic Burnout showed a significant positive correlation with Cognitive Overload ($r = 0.263$, $p < 0.01$), Perceived Learning Support ($r = 0.203$, $p < 0.01$), Emotional Exhaustion ($r = 0.177$, $p < 0.05$), and Digital Aging ($r = 0.173$, $p < 0.05$). However, Academic Burnout was not significantly correlated with Digital Deprivation ($r = 0.006$, $p > 0.05$).

Among the independent variables, Cognitive Overload showed a significant positive correlation with Emotional Exhaustion ($r = 0.164$, $p < 0.05$). Emotional Exhaustion also showed a positive correlation with Perceived Learning Support ($r = 0.203$, $p < 0.01$). The inter-correlations among Digital Deprivation, Cognitive Overload, and Digital Aging were weak and non-significant, indicating that these variables measure distinct constructs.

Table 3. Regression Analysis

Variables	Academic burnout
Digital Deprivation	-.011
Cognitive Overload	.226**
Digital Aging	.131
Emotion Exhaustion	.120
Perceived Learning Support	.166*
R-Square	.137
F-Value	5.082
Durbin-Watson Statistic	1.465

*Note: N = 166; *p < .05, ***p < .01.*

The regression analysis results are presented in Table 3, examining the effects of Digital Deprivation, Cognitive Overload, Digital Aging, Emotional Exhaustion, and Perceived Learning Support on Academic Burnout. The model was significant ($R^2 = .137$, $F = 5.082$, $p < .001$), explaining 13.7% of the variance in Academic Burnout. The Durbin Watson statistic of 1.465 confirms no autocorrelation.

Cognitive Overload had the strongest significant positive effect on Academic Burnout (β = .226, p < .01), supporting H2.Perceived Learning Support also showed a significant positive effect (β = .166, p < .05), which contradicts H5 (which predicted a negative relationship). Therefore, H5 was not supported . Digital Aging (β = .131, p > .05), Emotional Exhaustion (β = .120, p > .05), and Digital Deprivation (β = -.011, p > .05) were not significant predictors. Thus, only H2 was supported, while H1, H3, H4, and H5 were not supported.

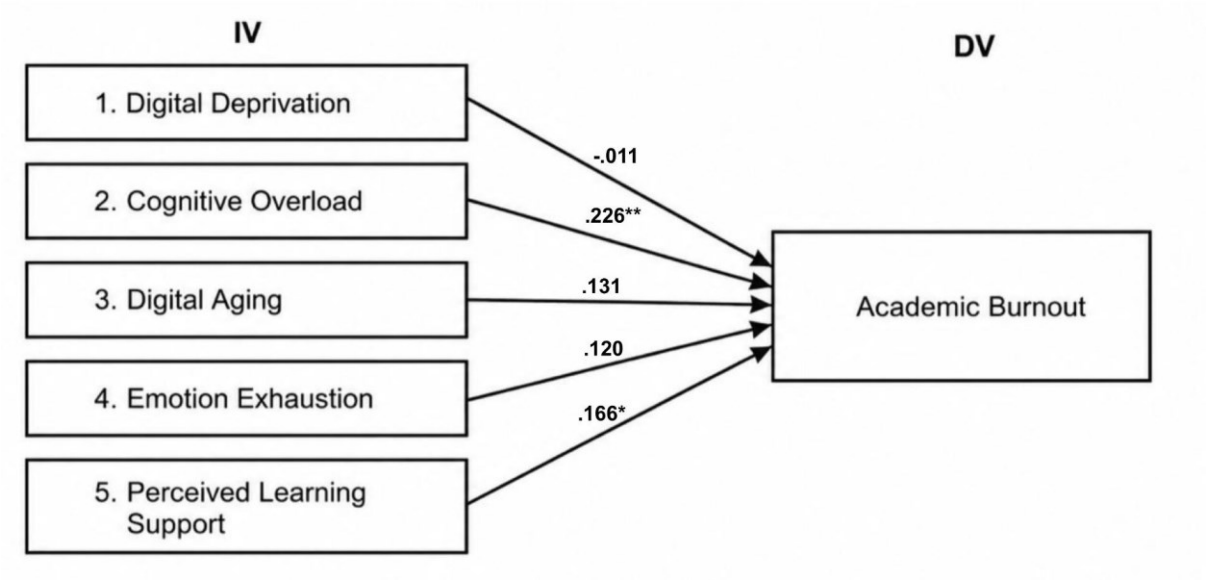


Figure 2. Structural Model

The diagram shows the relationship between several independent variables and academic burnout. The results indicate that Cognitive Overload has the strongest and most significant effect on academic burnout (β = 0.226**). Perceived Learning Support also shows a significant influence (β = 0.166*).

In contrast, Digital Aging (β = 0.131) and Emotional Exhaustion (β = 0.120) have weak and insignificant effects, while Digital Deprivation has almost no impact (β = -0.011). In conclusion, Cognitive Overload and Perceived Learning Support are the main factors influencing academic burnout, while the other variables have minimal effects.

DISCUSSION

This research examined the direct effects of five determinants on academic burnout among university students in blended learning environments. Specifically it investigated how digital deprivation, cognitive overload, digital aging, emotional exhaustion and perceived learning support influence academic burnout. The study aimed to address the research gap regarding the combined effects of these digital and psychological factors on student burnout in blended learning settings.

The results showed that cognitive overload has a significant positive effect on academic burnout (β = 0.226, p < 0.01). Perceived learning support also showed a significant positive effect (β = 0.166, p < 0.05) which is different from the expected negative relationship. Digital deprivation (β = -0.011, p > 0.05), digital aging (β = 0.131, p > 0.05) and emotional exhaustion (β = 0.120, p > 0.05) did not have significant effects on academic burnout. The regression model explained 13.7% of the variance in academic burnout (R^2 = 0.137, F = 5.082, p < 0.001).

The Influence of Digital Deprivation on Academic Burnout
This study found that digital deprivation does not have a significant effect on academic burnout (β = -0.011, p > 0.05). Therefore H1 was not supported. This finding is different from previous studies by van Deursen and van Dijk (2022) which found that digital deprivation significantly predicted student stress and burnout during the pandemic.

Studies byJafar et al. (2022)says that One possible explanation is that students may have developed effective coping strategies to handle digital deprivation. Individuals use available resources to prevent further resource loss. Students may have used mobile data, campus facilities, group discussions or adjusted study schedules to overcome internet problems. In addition, universities may have improved their digital infrastructure after the pandemic reducing the impact of digital deprivation on students.

Another explanation is that the measurement of digital deprivation may not have captured severe digital inequality. Most respondents were university students who likely had basic access to devices and internet facilities through the campus. The mean score for digital deprivation was relatively low (M = 2.456, SD = 0.719) showing that most students did not experience serious digital access problems.

The Influence of Cognitive Overload on Academic Burnout
This study found that cognitive overload has a significant positive effect on academic burnout (β = 0.226, p < 0.01). Therefore H2 is supported. This finding is consistent with Marzolla et al. (2025) who reported that cognitive load demands lead to sensory overload and fatigue and Li et al. (2026), who found that digital teaching increases learning burnout among university students.

Human working memory has limited capacity. When students process too much information from multiple platforms at the same time such as video lectures, discussion forums, chat messages, emails, and learning management system notifications their working memory becomes overloaded. This cognitive overload reduces mental energy and leads to fatigue, frustration and eventually academic burnout.

In blended learning environments students also need to switch between physical and digital learning spaces. This constant switching increases extraneous cognitive load and leaves fewer mental resources for learning. The descriptive statistics showed that students experienced high cognitive strain (Mean = 2.973, SD = 0.683) and often felt mentally drained after digital tasks. According to Li et al. (2026) continuous strain reduces self-regulation and causes mental paralysis which is an important early sign of academic burnout.

The findings show that universities and educators should focus on reducing information overload instead of only providing support. Cognitive overload was the strongest predictor among all variables (β = 0.226) showing its important role in student burnout.

The Influence of Digital Aging on Academic Burnout
This study found that digital aging does not have a significant effect on academic burnout (β = 0.131, p > 0.05). Therefore H3 was not supported. This finding differs from Nimrod (2022) who found that technostress and increasingly complex digital tools contribute to user exhaustion.

One possible explanation is that current university students are considered digital natives who grew up using technology. Digital natives are comfortable adapting to new technologies and learning new systems quickly. Unlike older generations, younger students may not find continuous digital updates stressful or exhausting.

Another explanation is that the university's learning platforms may be user friendly and easy to use. If universities invest in effective learning management systems with consistent interfaces students may experience lower technostress. Students may also have developed strong digital literacy skills through long term exposure to technology. The mean score for digital aging was moderate (M = 2.990, SD = 0.657) showing that students experienced some technology fatigue but not enough to significantly contribute to burnout.

The Influence of Emotional Exhaustion on Academic Burnout

The bivariate correlation analysis showed a significant positive relationship between emotional exhaustion and academic burnout ($r = 0.177$, $p = 0.023$). Descriptive statistics also showed high emotional exhaustion among students (Mean = 3.154, SD = 0.729) meaning students often felt emotionally drained by their studies. However in the multiple regression model emotional exhaustion did not show a uniquely significant direct effect on burnout ($\beta = 0.120$, $p = 0.111$). Therefore H4 was not supported.

This result provides a better understanding of blended learning environments. Students experience emotional exhaustion because they must manage both facetoface and online learning tasks. However emotional exhaustion lost its independent significance because it was positively correlated with cognitive overload ($r = 0.164$, $p = 0.035$). This suggests that emotional exhaustion is not an isolated issue but is closely linked to digital learning demands.

High study demands cause emotional exhaustion which can later develop into burnout. However, when cognitive overload was included in the regression model emotional exhaustion no longer independently predicted burnout because its effects were connected to cognitive strain caused by excessive digital demands.

This finding suggests that reducing cognitive overload may also help reduce emotional exhaustion. Addressing the main cause which is cognitive overload may be more effective than only treating emotional exhaustion symptoms.

The Influence of Perceived Learning Support on Academic Burnout

This study found that perceived learning support has a significant positive effect on academic burnout ($\beta = 0.166$, $p < 0.05$). This means students who perceived higher support from their institution and instructors also reported higher academic burnout. This finding contradicts H5 which predicted a negative relationship.

Firstly reverse causality may occur. Students who already experience high burnout may seek more support from lecturers and institutions. In other words burnout may increase students' awareness of support rather than support reducing burnout. Burned out students may ask for help, attend support sessions or request accommodations more often.

Secondly the support provided may not match students actual needs. According to Young-Jones et al. (2022) perceived instructor support includes autonomy, expectations, interpersonal relationships and engagement. If support only focuses on academic help such as tutoring or feedback and ignores emotional support or autonomy it may not effectively reduce burnout.

Third the quality of support is important. Students may know support is available but if the support is not useful, timely or accessible it may increase frustration and stress instead of reducing burnout.

Fourth the measurement of perceived learning support in this study may have measured students awareness of support rather than their satisfaction with the support provided. Future studies should clearly separate support availability from support effectiveness. Even though the relationship was different from expectations the significant finding shows that perceived learning support still plays an important role in academic burnout. Universities should not only provide support but also ensure the support is effective and meets students real needs.

CONCLUSION

This study investigated how digital deprivation, cognitive overload, digital aging, emotional exhaustion, and perceived learning support influence academic burnout among university students in blended learning environments. The findings demonstrate that cognitive overload is the most influential determinant, significantly affecting academic burnout. These results highlight the central role of digital information processing demands in shaping students' burnout experiences in blended learning settings.

In contrast, digital deprivation, digital aging, and emotional exhaustion did not exhibit significant direct effects on academic burnout within the collective regression model. Although emotional exhaustion showed a significant bivariate correlation with burnout, its effect was captured by cognitive overload, indicating that student emotional drainage is largely a consequence of excessive digital information processing rather than an independent cause of burnout. Digital deprivation and digital aging were found to have negligible effects, suggesting that students may have developed coping mechanisms or that these factors are less critical in the current post-pandemic educational context.

Perceived learning support was found to have a significant positive effect on academic burnout, which contradicts the hypothesized negative relationship. This unexpected finding suggests that students who are already experiencing high levels of burnout may seek more support from their institutions, or that the support provided may not be of sufficient quality to effectively reduce burnout. This highlights the need for universities to not only provide support but also ensure that support services are of high quality and meet students' actual needs.

The results confirm that cognitive overload is a critical predictor of academic burnout, reinforcing the importance of managing information load in digital learning environments. Universities and educators should prioritize reducing extraneous cognitive load by designing courses with clear structures, consolidating information on fewer platforms, and providing students with time-management training.

Overall, the results suggest that academic burnout in blended learning settings is driven primarily by cognitive factors related to information processing rather than access-related or aging-related digital factors. These findings provide practical implications for educators and administrators interested in reducing student burnout by addressing cognitive overload, improving the quality of learning support, and creating more manageable digital learning experiences.

LIMITATION

This study has several limitations even though it provides useful insights into the factors influencing academic burnout among university students in blended learning environments.

First, the R^2 value of 0.137 shows that the five independent variables explain only 13.7% of the variation in academic burnout. This means that 86.3% of the variation is caused by other factors not included in this study such as personal resilience, family support,

financial stress, sleep quality, physical activity, personality traits and mental health conditions. Future studies should include these factors to improve the explanatory power of the model.

Second, the sample size of 166 respondents was suitable for regression analysis but may not fully represent all university students in Malaysia. Since the survey was distributed online, students with better digital access were more likely to participate. Students facing serious digital access problems may not have been included. Future studies should use a larger and more diverse sample to obtain more comprehensive results.

Third, this study used a cross-sectional design where data was collected at one point in time. This limits the ability to determine causal relationships between the variables. For example, cognitive overload may lead to burnout, but students who are already experiencing burnout may also feel higher cognitive overload. Future research should use longitudinal studies to examine causal relationships and observe how digital stressors affect burnout over time.

Fourth, this study relied on self-reported survey data which may be affected by response bias. Respondents may have over-reported or under-reported their experiences because of social desirability, mood during survey completion or memory recall issues. The low Cronbach's alpha values ranging from 0.035 to 0.258 indicate that the measurement scales may have low reliability, which may have affected the results. Future studies should use validated scales with higher reliability and apply mixed-method approaches that combine qualitative and quantitative methods such as interviews and observations to gain deeper insights into students' behaviours and perceptions.

Fifth, the unexpected positive relationship between perceived learning support and academic burnout may suggest possible measurement issues. The scale used to measure perceived learning support may need further validation, or respondents may have interpreted the questions differently. Future studies should improve the measurement of perceived learning support by distinguishing between support availability, support quality and satisfaction with support.

Sixth, this study focused only on Malaysian university students. Therefore, the findings may not be applicable to students in other countries with different education systems, cultural backgrounds or levels of digital infrastructure. Future cross-cultural studies should compare how digital stressors influence academic burnout across different countries.

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DECLARATION OF CONFLICTING INTERESTS
The authors have declared no potential conflicts of interest concerning the study, authorship, and/or publication of this article.

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