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The Impact of Digital Technology Use in Learning on Students' Psychological Well-Being

Wee Ling Tan[1], Kok Ban Teoh[2], Wan Shahilla Alya Qatrunnada Wan Adnan[1], Qingshuo Wang[1], Chen Wang[1], Ruolin Wang[1], Daisy Mui Hung Kee[1]
[1]Universiti Sains Malaysia, Jalan Sg Dua, 11800 Minden, Pulau Pinang, Malaysia
[2]National Higher Education Research Institute, Universiti Sains Malaysia, 11900 Bayan Lepas, Penang, Malaysia
Corresponding Email: shahillaalya@student.usm.my

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ABSTRACT

Digital learning offers students greater flexibility and accessibility but may also introduce psychological challenges. This study examines how digital technology use, perceived ease of use, perceived effectiveness of digital learning, and COVID-19 learning transition experience relate to students' psychological strain. Using a quantitative design, data were collected through an online questionnaire from 152 students experienced in digital learning. Findings indicate that COVID-19 learning transition experience was the strongest positive predictor of psychological strain, whereas perceived effectiveness of digital learning was negatively associated with strain. Digital technology use alone did not significantly predict psychological strain. These results suggest that students' psychological well-being depends not merely on technology use but also on learning effectiveness and context. Universities should improve online learning design, minimize unnecessary digital burdens, provide psychological support, and foster meaningful student–lecturer interaction. Such measures can preserve the flexibility and academic benefits of digital learning while reducing potential psychological pressures among university students.

Keywords: Digital Learning; Digital Technology; Online Learning; Psychological Strain; Psychological Well-Being; Students

INTRODUCTION

Digital technology has developed rapidly and has significantly changed the way education is delivered around the world. In the past, teaching and learning mainly took place in physical classrooms, where students interacted directly with lecturers and classmates. Today, learning has become more flexible and accessible through online platforms, learning management systems, video conferencing tools, and other forms of educational technology. These digital tools allow students to access learning materials, recorded lectures, and academic discussions anytime and anywhere. Since the COVID-19 pandemic, schools and universities have relied heavily on digital platforms to continue teaching and learning activities, making digital learning an important part of modern education (Favale et al., 2020; Ullah et al., 2022).

Digital technology has brought many benefits to education. It enables students to learn at their own pace, access various learning resources, and participate in classes without being limited by location. Digital learning can also support student engagement, independent learning, and academic flexibility. In higher education, the integration of digital tools has become increasingly important because universities are expected to prepare students for technology-driven learning and working environments. This is also related to the growing emphasis on work-based learning and industry-relevant education, where students are encouraged to develop practical, digital, and professional competencies for future employability (An et al., 2022; Lim et al., 2024).

However, although digital technology has improved access to education, it may also create new challenges for students' psychological well-being. Online learning often requires students to spend long hours in front of screens, manage multiple digital platforms, complete online tasks, and communicate through virtual channels. Prolonged screen exposure may cause eye strain, fatigue, sleep disturbance, and physical discomfort, which can indirectly affect students' emotional condition and learning performance (Domingues-Montanari, 2017; Wolffsohn et al., 2023). At the same time, reduced face-to-face interaction may make students feel isolated, less connected, and less supported in their learning environment. These experiences can contribute to stress, anxiety, loneliness, and mental exhaustion (Chu & Li, 2022; Cockerham et al., 2021; Gillett-Swan, 2017).

Previous studies have shown that psychosocial conditions in the learning or working environment can influence well-being and burnout. For example, studies on psychosocial safety climate have highlighted that supportive environments are important in reducing burnout and psychological strain among Malaysian educators and academicians (Teoh & Kee, 2022; Teoh et al., 2021). Although these studies were conducted in educational work settings, the same idea is relevant to students' digital learning experiences. When students face unclear expectations, high learning demands, limited support, and reduced social interaction, their psychological well-being may be affected. Therefore, it is important to examine not only the use of technology itself but also whether the digital learning environment provides sufficient support, clarity, and meaningful engagement.

The COVID-19 pandemic further increased the importance of this issue. During the pandemic, many students were required to shift suddenly from face-to-face learning to fully online learning. This transition changed their daily routines, learning habits, communication patterns, and social experiences. Some students adapted well to the flexibility of online learning, while others experienced stress due to unstable internet access, difficulty concentrating at home, lack of interaction, and uncertainty in academic expectations (Aristovnik et al., 2020; Barrot et al., 2021). Even after the pandemic, the

experience of online learning transition may continue to affect how students perceive digital learning and how they respond emotionally to technology-supported education.

Therefore, this study aims to examine the impact of digital technology use in learning on students' psychological well-being. Specifically, the study focuses on four key factors: frequency of digital technology use, perceived ease of use, perceived effectiveness of digital learning, and COVID-19 learning transition experience. These factors are examined in relation to students' psychological strain, including stress, anxiety, mental exhaustion, and feeling overwhelmed by digital learning content. By understanding these relationships, this study can provide useful insights for universities, lecturers, and educational institutions in designing digital learning environments that are not only effective but also supportive of students' mental health.

This study is important because digital learning is no longer a temporary solution but a continuing feature of higher education. As universities continue to use online and blended learning approaches, students' psychological well-being should be considered together with academic performance and learning efficiency. Digital technology should not only make learning more convenient but should also support healthy, balanced, and meaningful learning experiences. Therefore, this study contributes to the discussion on how digital learning can be improved to protect students' well-being while maintaining the benefits of flexibility, accessibility, and educational innovation.

LITERATURE REVIEW

Digital Technology Use in Learning and Students' Psychological Strain

Digital technology use in learning refers to the use of digital devices, online platforms, learning management systems, video conferencing tools, and internet-based applications to support students' academic activities. In higher education, digital technology has become an important part of teaching and learning because it allows students to access learning materials, attend online classes, submit assignments, communicate with lecturers, and engage in academic discussions more conveniently. The COVID-19 pandemic further accelerated the use of digital technology in education, as many universities shifted from face-to-face teaching to online learning to ensure the continuity of education (Favale et al., 2020; Ullah et al., 2022).

Digital technology has created many positive changes in the learning process. It provides students with flexibility, accessibility, and opportunities for self-directed learning. Students can learn at their own pace, access recorded lectures, search for additional information, and complete learning activities without being limited by location. These advantages are important in modern higher education because students are expected to develop digital skills and adapt to technology-supported learning environments. The integration of digital tools is also consistent with the need to prepare students for future work environments, where digital competence and practical learning experiences are increasingly important (Lim et al., 2024).

However, the use of digital technology in learning may also affect students' psychological strain. Psychological strain refers to students' emotional and mental condition, including their ability to manage stress, anxiety, mental exhaustion, and feelings of being overwhelmed. Although digital learning can support academic flexibility, it can also increase students' psychological strain when it involves prolonged screen exposure, limited social interaction, high academic workload, and difficulty adapting to online platforms. Previous studies have suggested that online learning may affect students' physical and mental health, particularly when students experience isolation, reduced

interaction, and stress during digital learning (Chu & Li, 2022; Cockerham et al., 2021; Gillett-Swan, 2017).

The importance of a supportive learning environment can also be understood through studies on psychosocial safety climate. Teoh and Kee (2022) found that psychosocial safety climate is related to burnout among Malaysian research university academicians through job demands and work engagement. Similarly, Teoh et al. (2021) showed that psychosocial safety climate affected burnout among Malaysian educators during the COVID-19 pandemic. Although these studies focused on educators and academicians, the idea is relevant to students because digital learning environments also involve demands, support, engagement, and psychological strain. When students experience unclear instructions, limited support, weak interaction, and excessive learning demands, they may become more vulnerable to stress and emotional exhaustion.

Therefore, the relationship between digital technology use and students' psychological strain should not be viewed only from the perspective of technology access. Instead, it should also consider the quality of the learning experience, the level of support provided, and the psychological demands placed on students. Based on this discussion, the following hypothesis is proposed:

H1: Digital technology use in learning has a significant relationship with students' psychological strain.

Perceived Ease of Use of Digital Learning Platforms

Perceived ease of use refers to the extent to which students believe that a digital learning platform is easy to understand, access, and operate. According to Davis (1989), perceived ease of use is an important factor in technology acceptance because users are more likely to accept a system when they believe it is simple and requires little effort to use. In the context of digital learning, students are more likely to participate actively when online platforms are user-friendly, stable, and easy to navigate.

When digital learning platforms are easy to use, students may feel more confident and less frustrated. Simple platform design, clear instructions, and accessible learning materials can help students focus on learning instead of technical problems. For example, students may experience less stress when they can easily join online classes, download lecture notes, submit assignments, and communicate with lecturers. Studies on technology acceptance have also shown that students' positive emotions and technological self-efficacy can support their self-directed learning and engagement in digital environments (An et al., 2022; Pan, 2020).

However, perceived ease of use may not always reduce psychological strain. Even when students find a platform easy to use, they may still experience stress if the platform is linked to frequent assignments, constant notifications, long screen time, or heavy academic workload. In other words, an easy-to-use platform can increase students' participation in digital learning, but it may also expose them to more online academic demands. This may explain why ease of use can sometimes coexist with stress and fatigue in highly digitalised learning environments.

On the other hand, if platforms are difficult to use, students may experience confusion, frustration, and anxiety. Technical difficulties can interrupt the learning process and reduce students' motivation. This is especially important for students who are less familiar with technology or who face unstable internet access. Previous research on online learning challenges has shown that technological barriers, communication difficulties, and task management problems can affect students' learning experiences

during online education (Barrot et al., 2021; Gillett-Swan, 2017). Based on this discussion, the following hypothesis is proposed:

H2: Perceived ease of use of digital learning platforms is significantly associated with students' psychological strain.

Perceived Effectiveness of Digital Learning

Perceived effectiveness of digital learning refers to students' belief that online learning helps them understand lessons, complete academic tasks, improve performance, and achieve learning goals. When students believe that digital learning is effective, they are more likely to accept and engage with digital platforms. They may also feel more motivated because they can see the academic value of online learning (Chiu, 2021; Zhou & Yu, 2021).

Effective digital learning can reduce students' psychological strain by making the learning process clearer and more manageable. For example, recorded lectures allow students to review difficult topics, online resources provide additional learning support, and digital communication tools allow students to ask questions outside classroom hours. These features may help students feel more confident and supported in their studies. Student satisfaction with e-learning has also been linked to the quality, usefulness, and effectiveness of online learning experiences during the pandemic period (Fozeli et al., 2022).

However, digital learning may increase stress when students perceive it as ineffective. Poorly designed online lessons, unclear instructions, limited feedback, and lack of interaction can make students feel disconnected from the learning process. Students may also worry that they are not learning enough or that their academic performance will be affected. This can increase anxiety, especially when students are preparing for assessments or completing assignments under time pressure (Woldeab & Brothen, 2019).

Therefore, perceived effectiveness plays an important role in shaping students' psychological well-being. Digital learning is more likely to support students' well-being when students believe that it helps them learn effectively, communicate meaningfully, and achieve academic outcomes. In contrast, ineffective digital learning may increase psychological strain even if students have access to digital technology. This suggests that universities should not focus only on providing platforms but also on improving the quality of digital teaching and learning design. Based on this discussion, the following hypothesis is proposed:

H3: Perceived effectiveness of digital learning is negatively associated with students' psychological strain.

COVID-19 Learning Transition Experience and Students' Psychological Strain

COVID-19 learning transition experience refers to students' experience of shifting from face-to-face learning to online or blended learning during and after the pandemic. This transition was sudden for many students and required them to adapt quickly to new digital platforms, online communication methods, independent study routines, and changing academic expectations. Although online learning allowed education to continue during the pandemic, the sudden shift also created challenges such as reduced social interaction, unstable learning routines, limited lecturer-student communication, and difficulty concentrating at home.

Previous studies have shown that the COVID-19 pandemic significantly affected students' learning experiences and psychological well-being. Many students

experienced stress, anxiety, loneliness, and uncertainty because of the sudden shift to online education (Aristovnik et al., 2020; Barrot et al., 2021). In addition, reduced face-to-face interaction with classmates and lecturers may weaken students' sense of belonging and academic support, which can further increase psychological strain (Chu & Li, 2022; Cockerham et al., 2021).

The COVID-19 transition experience may continue to influence students even after the emergency phase of the pandemic. Students who faced difficulties adapting to online learning may continue to associate digital learning with stress, uncertainty, and emotional exhaustion. This suggests that students' psychological strain may not be caused only by digital technology use itself, but also by the broader learning context in which digital technology was introduced and experienced. Therefore, it is important to examine COVID-19 learning transition experience as a factor that may influence students' psychological strain.

This is also consistent with studies showing that psychosocial conditions during the COVID-19 period affected educators' burnout and well-being (Teoh et al., 2021). Although the context is different, the pandemic created similar psychosocial challenges for students, including sudden changes, uncertainty, reduced support, and increased emotional pressure. Therefore, students' pandemic-related learning experiences should be considered when examining the psychological impact of digital learning. Based on this discussion, the following hypothesis is proposed:
H4: COVID-19 learning transition experience is positively associated with students' psychological strain.

RESEARCH METHOD

Research Design

This study adopted a quantitative research design to examine the impact of digital technology use in learning on students' psychological well-being. A quantitative approach was considered suitable because the study aimed to measure students' perceptions, identify patterns in their responses, and examine the relationships between digital learning factors and psychological strain. The main variables examined in this study were digital technology use, perceived ease of use, perceived effectiveness of digital learning, COVID-19 learning transition experience, and students' psychological strain.

Population and Sample

The target population of this study consisted of university students who had experience using digital technology for learning. These students were selected because they were familiar with online learning platforms, digital devices, and technology-supported academic activities. The respondents included students who used digital technology for purposes such as attending online classes, accessing learning materials, completing assignments, communicating with lecturers, and participating in online academic activities.

A total of 152 valid responses were collected and included in the analysis. The sample included students from different academic levels and fields of study. Although the respondents were mainly concentrated among students from business and management programmes, the data still provided useful insights into students' experiences with digital learning and its relationship with psychological well-being.

Data Collection Procedure

Data were collected through an online questionnaire distributed using Google Forms. The online questionnaire method was appropriate because it allowed the researchers to reach students who had experience with digital learning and enabled respondents to answer conveniently through an online platform. The survey link was shared through social and academic networks.

Before answering the questionnaire, respondents were informed about the purpose of the study. Participation was voluntary, and respondents were asked to answer based on their own learning experiences. The questionnaire was designed to collect demographic information and responses related to the main research variables. After data collection, incomplete or invalid responses were removed, and 152 valid responses were retained for analysis.

Research Instrument

The research instrument was a structured questionnaire consisting of several sections. The first section collected demographic information, including gender, age, education level, field of study, daily online learning duration, and the type of digital device most frequently used for learning. The remaining sections measured the main constructs of the study, namely frequency of digital technology use, perceived ease of use, perceived effectiveness of digital learning, students' psychological strain, and COVID-19 learning transition experience.

All measurement items were assessed using a five-point Likert scale, ranging from 1 = strongly disagree to 5 = strongly agree. The Likert scale was used because it is suitable for measuring respondents' perceptions, attitudes, and levels of agreement toward the statements in the questionnaire.

The measurement items were adapted from previous studies on online learning, digital technology use, and students' psychological well-being. Specifically, the items were adapted from Wang et al. (2021) and Deng and Yang (2021), whose instruments reported acceptable reliability values of 0.85 and above. Therefore, the adapted items were considered suitable for measuring the constructs in this study. The constructs measured in this study were as follows:

Frequency of Digital Technology Use was measured using four items that assessed how frequently students used digital technology and online platforms for learning purposes.

Perceived Ease of Use was measured using four items that assessed the extent to which students perceived digital learning platforms as easy to access, understand, and operate.

Perceived Effectiveness of Digital Learning was measured using four items that assessed whether students believed digital learning helped them understand lessons, complete learning tasks, and improve their academic learning experience.

Students' Psychological Strain was measured using seven items that assessed students' stress, anxiety, mental exhaustion, and feelings of being overwhelmed in relation to digital learning.

COVID-19 Learning Transition Experience was measured using five items that assessed students' experiences of shifting from face-to-face learning to online or blended learning during and after the COVID-19 pandemic.

Data Analysis

The collected data were analysed using IBM SPSS Statistics version 28. Descriptive statistics were first used to summarise the demographic profile of the respondents and the mean scores of the main study constructs. These descriptive results helped to explain the general pattern of students' digital learning experiences and psychological strain.

Multiple regression analysis was then conducted to examine whether digital learning factors significantly predicted students' psychological strain. Psychological strain was treated as the dependent variable, while digital technology use, perceived ease of use, perceived effectiveness of digital learning, and COVID-19 learning transition experience were treated as independent variables. Multiple regression analysis was appropriate because the study aimed to examine the combined influence of several independent variables on one dependent variable.

RESULTS

A total of 152 valid responses were collected and analysed in this study. Based on the demographic profile, most respondents were female (69.1%) and aged between 21 and 24 years old (69.1%). Most respondents were studying at the diploma or bachelor's degree level. In terms of field of study, the largest group of respondents came from business and management programmes (67.8%). Most respondents reported that they studied online for 2 to 4 hours per day (59.9%), while laptops were the most frequently used device for learning purposes (63.8%).

Although the sample was relatively concentrated among certain demographic groups, particularly female students and students from business and management programmes, the respondents still provided useful insights into students' experiences with digital learning and its psychological effects. Therefore, the data were considered suitable for examining the relationship between digital technology use in learning and students' psychological strain.

Descriptive statistics were used to examine the mean scores and standard deviations of the main constructs. As shown in Table 1, the mean scores for digital technology use, perceived ease of use, perceived effectiveness of digital learning, psychological strain, and COVID-19 transition experience were 3.26, 3.43, 3.47, 3.01, and 3.43, respectively. These results indicate that students generally reported a moderate level of digital technology use, perceived ease of use, perceived effectiveness, psychological strain, and COVID-19 learning transition experience.

The results show that perceived effectiveness of digital learning recorded the highest mean score (M = 3.47), followed by perceived ease of use and COVID-19 transition experience, both with a mean score of 3.43. This suggests that students generally perceived digital learning as useful, accessible, and relevant to their learning experience. However, the mean score for psychological strain was also moderate (M = 3.01), indicating that students experienced some level of stress, anxiety, mental exhaustion, or feeling overwhelmed in relation to digital learning.

Table 1. Descriptive Statistics (N = 152)

Construct	Minimum	Maximum	Mean	Standard Deviation
Digital Technology Use	1.00	5.00	3.26	1.17
Perceived Ease of Use	1.00	5.00	3.43	0.87
Perceived Effectiveness	1.00	5.00	3.47	0.88
Psychological Strain	1.00	5.00	3.01	0.81
COVID-19 Transition Experience	1.00	5.00	3.43	0.85

At the item level, the psychological strain items were generally close to the midpoint of the scale. Feeling overwhelmed by digital learning content recorded the highest mean score (M = 3.10), followed by stress (M = 3.03), anxiety (M = 2.97), and mental exhaustion (M = 2.95). These findings suggest that although students were generally able to engage with digital learning, they still experienced moderate psychological strain, particularly in relation to digital learning overload.

Multiple regression analysis was conducted to examine whether digital learning factors significantly predicted students' psychological strain. Psychological strain was treated as the dependent variable, while digital technology use, perceived ease of use, perceived effectiveness of digital learning, and COVID-19 transition experience were included as independent variables.

Table 2. Regression Results Between Digital Learning Factors and Psychological Strain

Construct	B	SE B	β	p
Digital Technology Use	0.023	0.096	0.033	0.812
Perceived Ease of Use	0.309	0.130	0.332	0.019
Perceived Effectiveness	-0.324	0.141	-0.349	0.024
COVID-19 Transition Experience	0.485	0.117	0.508	< .001

Note. $R^2 = 0.294$, adjusted $R^2 = 0.274$, model $p < .001$.

As shown in Table 2, the regression model was statistically significant, with $R^2 = 0.294$ and adjusted $R^2 = 0.274$. This means that the four independent variables explained 29.4% of the variance in students' psychological strain. Among the predictors, COVID-19 transition experience was the strongest positive predictor of psychological strain ($\beta = 0.508$, $p < .001$). This indicates that students who reported stronger COVID-19 learning transition experiences were more likely to experience higher psychological strain.

Perceived ease of use was also a significant positive predictor of psychological strain ($\beta = 0.332$, $p = 0.019$). This result suggests that students who perceived digital learning platforms as easier to use also reported higher psychological strain. Although this finding may appear unexpected, it may indicate that students who are more involved in digital learning platforms are also more exposed to online academic demands, frequent tasks, and continuous digital engagement.

Perceived effectiveness of digital learning was a significant negative predictor of psychological strain ($\beta = -0.349$, $p = 0.024$). This means that students who perceived digital learning as more effective reported lower psychological strain. In other words, when students believed that digital learning helped them understand lessons, complete

academic tasks, and support their academic performance, they were less likely to experience stress and mental exhaustion.

However, digital technology use was not a significant predictor of psychological strain (β = 0.033, p = 0.812). This finding suggests that the frequency of using digital technology alone did not significantly influence students' psychological strain. Instead, students' psychological strain appeared to be more strongly related to their COVID-19 transition experience, perceived ease of use, and perceived effectiveness of digital learning.

Figure 1 presents the regression model visually. The model shows that students' psychological strain was not mainly influenced by the frequency of digital technology use. Instead, psychological strain was more strongly associated with students' COVID-19 learning transition experience, their perceived ease of use of digital learning platforms, and their perceived effectiveness of digital learning. Overall, the findings suggest that students' psychological well-being in digital learning environments depends not only on how often they use technology, but also on how they experience, understand, and benefit from digital learning.

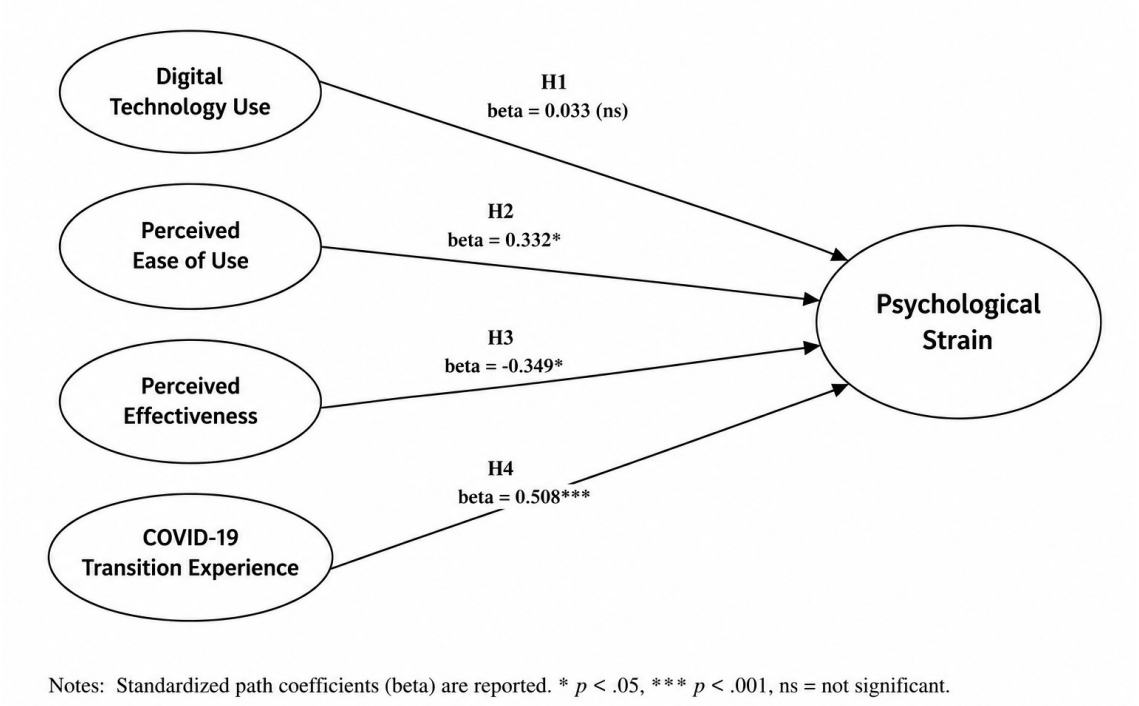


Figure 1. Summary of Regression Paths for Psychological Strain

DISCUSSION

This study examined the impact of digital technology use in learning on students' psychological strain. Overall, the findings show that students' digital learning experience is not completely positive or negative. Students generally reported moderate levels of digital technology use, perceived ease of use, perceived effectiveness of digital learning, psychological strain, and COVID-19 transition experience. This suggests that digital learning has become a normal part of students' academic lives, but it can still create psychological pressure when students experience learning overload, reduced interaction, or difficulty adapting to changing learning environments.

The regression results show that the four digital learning factors explained 29.4% of the variance in students' psychological strain. Among the predictors, COVID-19 transition experience was the strongest positive predictor of psychological strain. Perceived ease

of use was also positively associated with psychological strain, while perceived effectiveness of digital learning was negatively associated with psychological strain. However, digital technology use alone did not significantly predict psychological strain. These findings suggest that students' psychological strain is not caused simply by using digital devices frequently, but by how students experience digital learning, whether they find it effective, and how they adapted to online learning during and after the pandemic. This is consistent with previous studies suggesting that the effect of digital technology on well-being depends on the learning context, type of use, and support available to learners rather than technology use alone (Dienlin & Johannes, 2020; Gregory, 2023).

The Influence of Digital Technology Use on Students' Psychological Strain

The results show that digital technology use did not significantly predict students' psychological strain. This means that the frequency of using digital devices and online learning platforms alone did not directly increase or decrease students' stress, anxiety, or mental exhaustion. One possible explanation is that digital technology has already become part of students' daily academic life. Students are familiar with using laptops, smartphones, online platforms, and digital communication tools for learning, so the frequency of use itself may not be the main source of psychological pressure.

This finding is consistent with previous studies suggesting that the impact of digital technology use depends on the purpose, context, and quality of use rather than screen exposure alone (Dienlin & Johannes, 2020; Gregory, 2023). For example, students may use digital technology frequently for meaningful learning activities such as watching recorded lectures, accessing academic materials, or communicating with lecturers. In such cases, technology use may support learning rather than harm well-being. However, if digital technology is used in a poorly structured learning environment, it may create stress through excessive workload, unclear expectations, and lack of interaction.

Therefore, the findings suggest that universities should not assume that digital technology use is automatically harmful to students' psychological well-being. Instead, attention should be given to the quality of digital learning design, the amount of academic workload, and the level of support provided to students. Digital technology can be useful and effective when it is used in a structured, meaningful, and supportive way.

The Influence of Perceived Ease of Use on Students' Psychological Strain

The results show that perceived ease of use was positively associated with students' psychological strain. This finding may appear unexpected because platforms that are easy to use are usually expected to reduce stress. However, in this study, students who perceived digital learning platforms as easier to use also reported higher psychological strain. One possible explanation is that students who find digital platforms easy to use may also use them more actively and frequently. As a result, they may be more exposed to online assignments, digital notifications, academic deadlines, and continuous online engagement.

This finding suggests that ease of use alone may not be enough to protect students from psychological strain. Even when platforms are simple and accessible, students may still feel stressed if the online learning environment involves too many tasks, excessive screen time, or constant academic demands. In other words, convenient technology can increase participation, but it may also increase workload and digital pressure when not properly managed.

This result is relevant to previous research on online learning challenges, which shows that digital learning can create stress when students face academic demands, weak communication, and difficulty managing online tasks (Barrot et al., 2021; Gillett-Swan,

2017). It also supports the idea that technology acceptance can coexist with fatigue and stress in highly digitalised learning environments. Therefore, universities should not only make platforms easy to use but also ensure that the learning activities delivered through these platforms are manageable, well-organised, and not psychologically overwhelming.

The Influence of Perceived Effectiveness of Digital Learning on Students' Psychological Strain

The findings show that perceived effectiveness of digital learning was negatively associated with students' psychological strain. This means that students who believed digital learning helped them understand lessons, complete academic tasks, and support their academic performance were less likely to experience psychological strain. This is an important finding because it shows that digital learning is not necessarily harmful. When students perceive digital learning as useful and effective, it may reduce stress and support their well-being.

This result is consistent with previous studies showing that students are more likely to engage positively with digital learning when they believe it is useful and beneficial for their academic development (Chiu, 2021; Zhou & Yu, 2021). Digital learning can reduce psychological pressure when it provides clear learning materials, recorded lectures, flexible access, timely feedback, and meaningful communication with lecturers. These features help students feel more confident and supported in their learning process.

The finding also suggests that effectiveness is more important than access alone. Providing online platforms is not enough if students do not feel that the platforms improve their learning. Therefore, universities and lecturers should focus on the quality of digital teaching. Online activities should be clearly structured, relevant to learning outcomes, and designed to help students understand the subject matter. When students can see the academic benefits of digital learning, they are more likely to experience lower stress and higher confidence.

The Influence of COVID-19 Learning Transition Experience on Students' Psychological Strain

The strongest predictor of students' psychological strain was COVID-19 learning transition experience. This means that students who experienced greater difficulty during the transition from face-to-face learning to online or blended learning were more likely to report higher psychological strain. This finding shows that students' current psychological responses to digital learning may still be influenced by their past pandemic learning experiences.

During the COVID-19 pandemic, many students had to adapt suddenly to online learning. This transition changed their daily routines, learning habits, communication patterns, and social experiences. Some students faced unstable internet access, difficulty concentrating at home, reduced interaction with lecturers and classmates, and uncertainty about academic requirements. These challenges may have increased stress, anxiety, loneliness, and emotional exhaustion among students (Aristovnik et al., 2020; Barrot et al., 2021; Chu & Li, 2022).

This finding also supports previous research showing that reduced social interaction during online learning can weaken students' sense of belonging and emotional support (Cockerham et al., 2021). When students are disconnected from their academic community, they may feel less motivated and more psychologically strained. Although universities have returned to face-to-face or blended learning after the pandemic, the experience of sudden digital transition may continue to influence students' attitudes and emotions toward online learning.

Therefore, universities should recognise that students' digital learning experience is shaped not only by current technology use but also by their previous learning disruptions. Support systems should be provided for students who continue to experience stress or difficulty adapting to blended learning. These support systems may include clearer online learning guidelines, academic advising, counselling services, peer support, and structured opportunities for face-to-face interaction.

Managerial Implications and Practical Applications

The findings of this study provide several practical implications for universities, lecturers, and educational administrators. First, universities should reduce unnecessary digital burden by simplifying platform navigation, reducing the number of platforms used in a course, and providing clear instructions for online learning tasks. Students may experience stress when they need to manage too many platforms, deadlines, and digital communication channels at the same time.

Second, lecturers should design digital learning activities in shorter and more manageable sections. Long online classes and continuous screen exposure may increase fatigue and reduce concentration. Previous studies have shown that prolonged screen exposure can contribute to eye strain, fatigue, sleep problems, and other physical discomforts that may affect students' learning experience and well-being (Domingues-Montanari, 2017; Wolffsohn et al., 2023). Therefore, online learning should include breaks, interactive activities, and opportunities for students to ask questions.

Third, universities should improve the effectiveness of digital learning rather than focusing only on platform access. The results show that perceived effectiveness of digital learning can reduce psychological strain. Therefore, digital learning should be designed to help students understand lessons clearly, complete academic tasks effectively, and receive useful feedback. When students feel that digital learning supports their academic progress, they are less likely to experience stress.

Fourth, universities should provide stronger psychosocial support for students. Studies on psychosocial safety climate have shown that supportive environments are important in reducing burnout and psychological strain among educators and academicians (Teoh & Kee, 2022; Teoh et al., 2021). Although these studies focused on educators, the same principle is relevant to students because students also need clear expectations, accessible lecturers, peer interaction, and mental health support. Digital learning should not only focus on academic delivery but also on students' emotional and social needs.

Finally, blended learning should be planned carefully rather than treated as a temporary or emergency solution. Universities should combine the flexibility of online learning with the social and emotional benefits of face-to-face interaction. This balance can help students experience digital learning as both effective and psychologically manageable.

Summary of Discussion

In summary, this study shows that students' psychological strain in digital learning is influenced more by the quality and context of digital learning than by technology use alone. Digital technology use itself was not a significant predictor of psychological strain, but perceived ease of use, perceived effectiveness, and COVID-19 transition experience were significant predictors. These findings suggest that students' well-being depends on whether digital learning is meaningful, manageable, supportive, and effective. Therefore, the goal should not be to reduce digital learning completely, but to improve its design so that it supports both students' academic performance and psychological well-being.

CONCLUSION

This study examined the impact of digital technology use in learning on students' psychological well-being. Specifically, the study focused on digital technology use, perceived ease of use, perceived effectiveness of digital learning, and COVID-19 learning transition experience as predictors of students' psychological strain. Based on the findings, students generally reported moderate levels of digital technology use, perceived ease of use, perceived effectiveness, psychological strain, and COVID-19 transition experience.

The findings show that digital technology use alone did not significantly predict students' psychological strain. This suggests that the frequency of using digital devices and online learning platforms may not directly affect students' stress, anxiety, or mental exhaustion. Instead, students' psychological strain appears to be more strongly influenced by the quality and context of digital learning. Therefore, the impact of digital technology should not be judged only by how often students use it, but also by how students experience digital learning.

The study found that perceived ease of use was positively associated with psychological strain. Although easy-to-use platforms are usually expected to reduce stress, this finding suggests that students who are more comfortable using digital learning platforms may also be more exposed to online tasks, deadlines, notifications, and continuous digital academic demands. Therefore, universities should not only provide user-friendly platforms but also ensure that online learning activities are manageable and not overwhelming for students.

In contrast, perceived effectiveness of digital learning was negatively associated with psychological strain. This means that students who believed digital learning helped them understand lessons, complete academic tasks, and support their academic performance were less likely to experience psychological strain. This finding highlights the importance of designing digital learning experiences that are meaningful, structured, and academically useful.

The strongest predictor of psychological strain was COVID-19 learning transition experience. Students who experienced greater difficulty during the transition from face-to-face learning to online or blended learning were more likely to report higher psychological strain. This shows that the pandemic-related learning transition may continue to influence students' emotional responses toward digital learning. Therefore, universities should provide appropriate academic, technical, and psychosocial support to help students adapt to digital and blended learning environments.

Overall, this study concludes that digital learning is not entirely positive or negative. It offers flexibility, accessibility, and learning convenience, but it can also create psychological strain if students experience overload, limited support, and weak interaction. Therefore, universities should improve the quality of digital learning, reduce unnecessary digital burden, encourage meaningful student-lecturer interaction, and provide mental health support. A balanced approach is needed so that digital learning can support both students' academic performance and psychological well-being.

LIMITATION

This study has several limitations. First, although 152 valid responses were collected, the sample was relatively concentrated among female students and students from business and management programmes. Therefore, the findings may not fully represent students from other fields of study, academic levels, or demographic

backgrounds. Future studies should include a larger and more diverse sample to provide a more balanced understanding of students' digital learning experiences.

Second, this study used self-reported questionnaire data. Respondents answered based on their own perceptions and experiences, which may be influenced by personal interpretation, mood, memory, or current academic workload. Therefore, the findings should be interpreted carefully. Future research may combine questionnaire data with interviews or focus groups to obtain deeper insights into students' psychological experiences in digital learning.

Third, this study adopted a cross-sectional research design, where data were collected at one point in time. As a result, the study can identify relationships between variables but cannot confirm cause-and-effect relationships. Future studies may use longitudinal research designs to examine how students' digital learning experiences and psychological well-being change over time.

Fourth, this study focused mainly on digital technology use, perceived ease of use, perceived effectiveness, and COVID-19 learning transition experience. Other factors, such as lecturer support, peer interaction, internet quality, digital literacy, academic workload, and family environment, may also influence students' psychological well-being. Future studies should include these additional factors to provide a more comprehensive understanding of digital learning and students' mental health.

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DECLARATION OF CONFLICTING INTERESTS

The authors declare that there is no conflict of interest regarding the research, authorship, and publication of this article.

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ABOUT THE AUTHORS

1st Author
Dr. Tan Wee Ling is an education specialist and Senior Lecturer in School of Educational Studies (PPIP), Universiti Sains Malaysia, with a strong focus on STEM education, digital pedagogy, and teacher professional development in Southeast Asia. Her work spans curriculum innovation, assessment design, and classroom-based research, with particular interest in game-based learning, design thinking, and the integration of emerging technologies to strengthen 21st-century competencies. As a Microsoft Global Training Partner, she designs and facilitates capacity-building programmes that support educators in adopting effective, evidence-informed digital teaching practices. Dr. Tan actively contributes to regional collaborations, workshops, and scholarly dissemination, translating research into practical strategies that improve teaching and learning outcomes across diverse educational contexts.

2nd Author
Ts. Dr. Teoh Kok Ban is a Senior Lecturer at the National Higher Education Research Institute (IPPTN), Universiti Sains Malaysia. His work centers on higher education, human development, and organizational wellbeing, integrating research, counseling, and professional training to generate meaningful impact in education and society. He holds a PhD in Organizational Behavior and Development, along with Master's degrees in Statistics and Counseling, enabling him to combine quantitative expertise with human-centered approaches. A Professional Technologist (Ts.) registered with the Malaysian Board of Technologists and a Registered Counselor with the Malaysian Board of Counselors, he bridges technical and psychological perspectives in his work. As an HRD Corp Accredited Trainer, he leads capacity-building initiatives and academic collaborations, while actively contributing to research and professional service.

3rd Author
Wan Shahilla Alya Qatrunnada Wan Adnan is currently an undergraduate accounting student at the School of Management, Universiti Sains Malaysia.
Email: shahillaalya@student.usm.my

4th Author
Wang Qingshuo is currently an undergraduate management student at the School of Management, Universiti Sains Malaysia.
Email: qingshuo20060501@student.usm.my

5th Author
Wang Chen is currently an undergraduate management student at the School of Management, Universiti Sains Malaysia.

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Email: tommywang@student.usm.my

6th Author

Wang Ruolin is currently an undergraduate management student at the School of Management, Universiti Sains Malaysia.
Email: wangruolin@student.usm.my

7th Author

Dr. Daisy Mui Hung Kee is an Associate Professor at the School of Management, Universiti Sains Malaysia (USM). She earned her Ph.D. from the University of South Australia and an MBA from USM. She has authored 90 Web of Science-indexed publications. Dr. Kee serves as the Country Director for the Association of International Business and Professional Management (AIBPM) and the STAR Scholars Network.
Email: daisy@usm.my
ORCID ID: 0000-0002-7748-8230