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Exploring the Challenges of E-learning in the Post-Pandemic Educational Landscape: A Qualitative Approach

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Abstract

The COVID-19 pandemic prompted a rapid shift to online learning, revealing numerous challenges that impact students' academic performance and well-being. This study explores the lived experiences of first-year social science students at the Universiti Teknikal Malaysia Melaka during the post-pandemic. Limited social interaction, declining student motivation, technical disruptions, and digital inequality have emerged as significant barriers to effective teaching and learning in digital environments. The main objective of this study is to explore

the challenges of e-learning in the post-COVID-19 era and how these challenges continue to affect student performance. By employing qualitative research design and semi-structured focus group interviews were conducted with 14 students, which were then analyzed using thematic analysis. The findings reveal that lack of motivation and engagement, technical challenges and digital inequality, limited peer interaction and support, as well as difficulties in self-regulation and time management, significantly hinder students' academic performance**.** These challenges contribute to knowledge gaps, emotional distress, and hindered skill development. Future research should focus on developing resilient, inclusive e-learning models that address ongoing inequalities and incorporate students' perspectives to improve the quality and accessibility of digital education in a post-pandemic world.
Keyword: Digital Inequality, E-Learning, Student Performance

Introduction

In today's world, e-learning has become a transformative model in education, reshaping how teaching and learning occur in the modern era (Maqbool et al., 2024). Broadly speaking, e-learning refers to the delivery of educational content via internet-enabled platforms, enabling learners to access courses and materials through computers, tablets, or smartphones, either synchronously or asynchronously (Fabriz et al., 2021; Kimura et al., 2023; Hasim et al., 2025). This model offers unprecedented flexibility, allowing students to learn at their own pace, wherever they are, and often at a lower cost. Unlike traditional classroom learning, which requires fixed schedules and physical attendance, e-learning gives students the freedom to choose when and where to study (Basar et al., 2021). For example, learners can review recorded lectures at a convenient time, pause and repeat difficult parts, or complete assignments at their own speed. This flexibility is especially helpful for working adults, part-time students, or those with family responsibilities. Moreover, e-learning often reduces costs related to transportation, printed materials, and accommodation (Dhawan, 2020). Many online resources are available for free or at a lower price, making education more accessible and affordable for a wider group of people.

The onset of the COVID-19 pandemic in early 2020 accelerated the global shift toward e-learning. With school closures affecting over 1.5 billion students worldwide, institutions rapidly pivoted remote instruction to ensure academic continuity (Tadesse & Muluye, 2020). This shift revealed both the potential and the difficulties inherent in large-scale learning implementation. One of the key benefits observed during the pandemic was the flexibility and accessibility of learning (Nkwanyana & Fagbadebo, 2024). Students could engage with materials anytime, while educators leveraged multimedia tools such as videos, quizzes, and interactive content, to create student-centered learning experiences (Kerimbayev et al., 2023). Technology also reduced travel and administrative burdens, simplifying tasks like attendance tracking and lecture recording (Mohammed & Zidan, 2023). These advantages helped sustain education delivery when in-person classes were impossible.

Despite these gains, significant challenges emerged during the COVID-19 period. The most pressing issue was the digital divide: many students lacked reliable internet or suitable devices, particularly in less-developed regions (Afzal et al., 2023). Research in Malaysia and other developing countries highlighted additional obstacles, such as poor learning environments at home, social isolation, and physical and mental health concerns (Asadullah & Tham, 2023; Jafar et al., 2023). Furthermore, educators also struggled such as lack of online-

pedagogy training and faced technical problems, unstable connectivity, and the inability to monitor student engagement in real time (Yeh & Tsai, 2022). As a result, the sudden pivot placed a heavy burden on instructors, often increasing stress and workload (Daniel & Van Bergen, 2023). In short, it can be summarized that e-learning is defined as the internet-based delivery of education that allows flexibility in time, place, and pace (Culduz, 2024). During COVID-19, it offered vital benefits such as accessibility, multimedia engagement, and reduced logistical costs (Qazi et al., 2024). However, it also laid bare persistent challenges, including digital inequities, poor learning environments, lack of training for educators, diminished interaction, and high stress levels among students and teachers (Jafar et al., 2023). Although the COVID-19 pandemic has lasted for more than three years, its long-term effects on students remain uncertain, and many of the challenges in online learning persist. Therefore, this study aims to explore the challenges of e-learning in the post-COVID-19 era and how these challenges continue to affect student performance.

Literature Review

The COVID-19 pandemic instigated a rapid and unplanned shift to e-learning across all levels of education, revealing a range of structural and pedagogical challenges. These obstacles not only hindered the effectiveness of remote instruction during the crisis but continue to affect student engagement, performance, and well-being in the post-pandemic era (Ezra et al., 2021). One of the most widely reported barriers to successful e-learning was unequal access to technology and reliable internet connections (Zhao et al., 2021). A considerable number of students lacked stable internet access or adequate devices for attending virtual classes (Kamaludin & Sundarasen, 2023). The issue was particularly acute in low-income and rural areas of countries such as the Philippines and Malaysia, where underdeveloped digital infrastructure contributed to frequent disconnections and limited online participation. The digital divide led to disruptions in learning continuity, increased absenteeism, and ultimately, diminished academic performance (Jafar et al., 2022).

Another critical concern was the significant decline in student-instructor and peer-to-peer interaction, which traditionally play a pivotal role in enhancing the learning process. In online settings, students often had limited access to real-time feedback or direct engagement with instructors (Gao & Shi, 2023). According to Celik et al., (2023) this lack of synchronous support reduced learners' satisfaction and the overall quality of instruction. Additionally, the weakened sense of classroom community negatively impacted on students' motivation and cognitive engagement, making it more difficult to grasp complex concepts (Li & Xue, 2023). Self-regulation and autonomous learning also became essential competencies in the online learning environment. However, not all students were equipped with the necessary skills for effective time management, goal-setting, and self-motivation (Saks, 2024). Furthermore, a study done by Celik et al., (2023) observed that many learners, especially those with limited prior experience in independent study, developed passive learning habits, skipped online lessons, or failed to complete assignments. This lack of structure and accountability contributed to a spike in dropout rates reported to be as high as 20–50% in online settings, compared to 10–20% in traditional face-to-face education within Malaysia (Jafar et al., 2022). Moreover, the physical and psychological effects of prolonged screen time further compounded the difficulties. Students reported a range of health-related complaints, including headaches, eye strain, and musculoskeletal discomfort due to extended hours in front of a screen (Devi & Singh, 2023). More concerning, however, was the rise in mental

health issues such as anxiety, loneliness, and depression, which significantly affected cognitive functioning and learning outcomes. The mental burden associated with the pandemic, including uncertainty, isolation, and fear of illness, severely impacted students' ability to concentrate and perform academically (Martins et al., 2025). This phenomenon has been widely acknowledged in global surveys and studies focusing on tertiary education learners. Assessment and evaluation in the digital domain also posted significant challenges. Instructors found it difficult to ensure the integrity and reliability of online assessments, leading to concerns over academic dishonesty and grading fairness (Holden et al., 2021). Moreover, certain courses particularly those requiring hands-on practice such as laboratory work, fine arts, or technical training suffered from the lack of tactile learning environments (Sato et al., 2023). On a similar note, Tee et al., (2024) reported that this mismatch between course requirements and digital delivery contributed to uneven skill development and knowledge gaps. This issue led to negative effects on students' academic progress and long-term outcomes. When course content is not effectively adapted to online formats, students may struggle to fully grasp key concepts or develop essential skills, resulting in uneven learning experiences. This can create knowledge gaps that hinder academic performance, lower student confidence, and reduce engagement (Akpen et al., 2024).

Lastly, research from developing countries indicates that the long-term academic impact of these challenges remains uncertain. Many students face lingering effects, such as delayed graduations, inconsistent academic records, and reduced preparedness for the workforce, which collectively hinder students' academic performance and career readiness (Hongjun et al., 2024). These issues highlight the need for more resilient, inclusive, and student-centered approaches to digital education moving forward (Haleem et al., 2022). Hence, understanding the challenges of e-learning after the COVID-19 pandemic is crucial for improving the future of education. Despite the return to physical classrooms in many regions, the long-term effects of emergency remote learning such as digital inequality, reduced student engagement, and mental health issues, continue to impact learners' academic performance and overall well-being (Imran et al., 2025). By exploring these persistent challenges, educators, policymakers, and institutions can design more resilient, inclusive, and student-centered approaches that address diverse learning needs, bridge the digital divide, and ensure quality education in both online and blended environments. This understanding also helps prepare the education system for future disruptions, ensuring continuity and equity in learning for all students.

Research Methodology

In this study, qualitative research method was employed in the research design. By employing this method, it aims to explore, understand and interpret complex phenomena, behaviors, experiences, or meanings that cannot be quantified (Lim, 2025). Furthermore, it allows researchers to explore how and why people think, feel, and act in certain ways. Data collection methods for qualitative research include observations, textual or visual analysis (e.g., from books or videos), as well as interviews and other methods of gathering information (individual or group) (Busetto et al., 2020). However, the most common methods used, particularly in social sciences research, are interviews and focus groups. To collect qualitative information, a semi-structured interview was conducted in study. To collect qualitative information, a semi-structured interview was conducted in study. To better understand the challenges of e-learning that impact on e-learning performance, focus group discussions through a semi-structured online interview was conducted in this study. The reason that a

semi-structured online interview was conducted was because COVID-19 has affected intensely during the year 2020 (even from 2021 to 2022) and most of the plans to do fieldwork in a pre-planned place were postponed. Hence, a semi-structured online interview was conducted to gather the information from the key informants who have personal experiences towards the topic of interest (Ruslin et al., 2022).

Furthermore, undergraduate students from Universiti Teknikal Malaysia Melaka were selected to be interviewed in this research and presented as an interviewee. More specifically, first-year students from social science backgrounds were selected in this study. The main reason for selecting a social science background for this study is to discover the level of self-efficacy, engagement and readiness of the students towards e-learning performance among social science students, since previous studies have found that students who participated in engineering education had significantly higher self-efficacy and readiness in using e-learning system compared to those who are from social sciences background (Hasim et al., 2022; Hasim et al., 2023). It also claims that social sciences students are still lacking employability skills and should boost their self-efficacy, engagement, and readiness in terms of technical action, communication action, information action and computational action (Blayone et al., 2018; Hasim et al.,2024). Hence, first-year students were the most appropriate sample to interview in this study, as opposed to second-year students and others, since most of them are familiar with and have adapted well to the new learning system.

In this context, the actual sample size of the informants interviewed was subjected to data saturation. Rahimi (2024) states that data saturation occurs when the study can be replicated without obtaining additional latest information, and further coding is no longer feasible as a result. Furthermore, Ahmed (2025) recommended that saturation often occurs around 12 participants in homogeneous groups. As stated in the previous sections, homogeneous groups refer to those who have utilized e-learning platform in the post-COVID-19 pandemics. A study done by Latham (2013) indicates that around 11 participants in social science research. On a similar note, the finding is also consistent with Rahimi (2024) indicating where saturation occurred around 11 – 12 participants, who significantly reach 95% of saturation. Thus, this study obtained 14 respondents to be interviewed through a focus group discussion to achieve a higher degree of saturation and address the research objective of this study. Finally, the information gathered from the focus group discussion was analyzed using thematic analysis, incorporating observations and field notes, as proposed by Braun and Clarke (2006). This method involves several key steps: familiarization with the data, generation of initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the final report. Throughout this process, the following steps were implemented to generate themes aligned with the research objectives. Table 1 illustrates the actual sample size of the interviewee who participated in this study.

Table 1
Actual sample size of the interviewees

No.	Name (Pseudonyms)	Gender	Age	Race	Education Level: (Direct entry from)
1	Informant 1 (Haikal)	Male	20	Khmer	Matriculation
2	Informant 2 (William)	Male	21	Chinese	STPM
3	Informant 3 (Afiq)	Male	21	Malay	STPM
4	Informant 4 (Adiba)	Female	21	Malay	STPM
5	Informant 5 (Ainul)	Female	21	Malay	STPM
6	Informant 6 (Tharshini)	Female	21	Indian	STPM
7	Informant 7 (Shima)	Female	21	Malay	STPM
8	Informant 8 (Fatima)	Female	21	Chinese	STPM
9	Informant 9 (Priya)	Female	21	Indian	STPM
10	Informant 10 (Faruq)	Male	21	Malay	STPM
11	Informant 11 (Zaryn)	Female	21	Malay	STPM
12	Informant 12 (Fujie)	Female	20	Malay	Matriculation
13	Informant 13 (Fujie)	Female	21	Malay	STPM
14	Informant 14 (Willson)	Male	21	Iban	STPM

Results and Discussion

Based on the findings extracted from the informants' interview transcripts, the results indicated that students faced numerous challenges such as lack of motivation and engagement, technical difficulties and digital inequality, limited social interaction and peer support, and difficulty in self-regulation and time management. By identifying these challenges in depth, the study seeks to understand how individuals experience and interpret them, thereby informing the development of responsive and context-specific solutions effectively.

Lack of Motivation and Engagement

A prevalent challenge identified by several participants in this study was a notable decline in motivation and engagement during online learning sessions. This issue was attributed to various factors inherent in the virtual learning environment. One significant concern raised by participants was the absence of face-to-face interaction, which appeared to contribute to a sense of disconnection and diminished participation. As Informant 1 (Haikal) stated, "without face-to-face interaction, I often felt disconnected and less motivated to participate."

This sentiment highlights the importance of social presence and interpersonal interaction in sustaining learner motivation, which can be lacking in asynchronous or minimally interactive online formats.

Moreover, the absence of a traditional classroom setting was another contributing factor to reduced engagement. Informant 5 (Ainul) observed that “the absence of a classroom atmosphere made it difficult to stay focused during lectures.” This indicates that the physical and social environment of a classroom often taken for granted plays a crucial role in fostering attentiveness and active participation. In online settings, where such an environment is missing or diminished, students may struggle to maintain concentration over extended periods.

Additionally, prolonged exposure to digital screens emerged as a physical and cognitive barrier to sustained engagement. Informant 9 (Priya) described feeling “mentally exhausted” from continuous screen time, which significantly reduced her interest in studying. This phenomenon, often referred to as "Zoom fatigue," reflects the mental strain associated with extended periods of virtual interaction and passive content consumption. The cumulative effect of these factors contributes to a broader sense of disengagement among learners, suggesting that online learning environments must be intentionally designed to mitigate these challenges by incorporating interactive elements, promoting social connection, and managing cognitive load. By fostering good engagement, incorporating engagement content, and supporting student well-being, the negative impact on student performance is likely to persist (Lasekan et al., 2024).

Technical Difficulties and Digital Inequality

Another critical challenge that emerged from participants’ experiences during online learning was the prevalence of technical difficulties and digital inequality. These issues significantly impacted students’ ability to participate fully and fairly in virtual academic environments. A recurring concern was unstable internet connectivity, which disrupted students' ability to follow lectures and engage in real-time learning activities. Informant 2 (William) noted, “my internet connection is not always stable, which caused me to miss important parts of lectures.” This points to the infrastructural disparities that persist in many regions, where reliable broadband access remains uneven.

In addition to connectivity problems, the lack of adequate technological devices further exacerbated the digital divide. Informant 7 (Shima) remarked that “not all students can afford up-to-date laptops or tablets,” underscoring the socioeconomic inequalities that affect students’ ability to participate equally in online learning. Outdated or shared devices, limited software capabilities, and the absence of necessary peripherals (e.g., webcams, microphones) contribute to an unequal learning experience, placing some students at a considerable disadvantage compared to their peers.

Moreover, technical issues during high-stakes assessments such as exams and presentations were reported to cause significant stress and perceive unfairness. Informant 12 (Fujie) shared that “technical issues during exams or presentations caused a lot of stress and unfair disadvantages.” These challenges not only affect students’ performance but also raise concerns about the validity and equity of online assessments. The lack of standardized digital

support and contingency plans can exacerbate anxiety and negatively impact academic outcomes. The absence of standardized support systems or technical accommodation also means that students who experience these issues often have no recourse, amplifying feelings of helplessness and discouragement. As long as these challenges remain unaddressed, they will continue to erode educational equity and impair overall student achievement in digital learning environments (Hyseni et al., 2023).

Limited Social Interaction and Peer Support

A significant challenge identified by participants was the limited social interaction and diminished peer support experienced in online learning environments. This lack of physical and informal contact substantially altered students' social learning dynamics and contributed to feelings of isolation and disengagement.

Informant 3 (Afiq) remarked, "I missed group discussions and being able to study with friends in the library," highlighting the loss of spontaneous, collaborative learning opportunities that often occur in physical academic settings. Such interactions are not only valuable for knowledge construction but also serve as a source of motivation and emotional support. The absence of casual, face-to-face communication restricts students' ability to form and maintain social bonds, which are essential for a sense of belonging within the academic community.

The shift to virtual platforms for group work and collaboration also presented its own set of challenges. Informant 6 (Tharshini) observed that "collaboration felt forced and less effective in online breakout rooms," pointing to the artificial nature of structured online group interactions. Many students found it difficult to build rapport, sustain conversation, or engage meaningfully in collaborative tasks due to time constraints, technical barriers, or lack of non-verbal cues. These limitations often led to reduced engagement and a decline in the quality of peer-to-peer learning experiences.

Additionally, several participants expressed a general sense of social disconnection. Informant 10 (Faruq) described feeling "isolated" and "less connected to classmates and lecturers," which illustrates the emotional toll that limited interpersonal engagement can have on students' overall well-being. Social interaction is a critical component of effective learning, particularly in higher education contexts where discussion, debate, and collaborative inquiry play central roles. The lack of these interactions in an online environment can contribute to academic dissatisfaction and diminished motivation. Over the time, these social deficits in the learning environment can lead to lower academic performance, reduced confidence, and decreased retention, especially among students who rely heavily on interpersonal interaction as part of their learning process (Akpen et al., 2024).

Difficulty in Self-Regulation and Time Management

In addition to the lack of social interaction and peer support, many students also reported significant challenges in self-regulation and time management during remote learning. The transition to an online environment required a high degree of autonomy, which several students found difficult to maintain. Informant 4 (Adiba), for instance, admitted, "*It was hard to stick to a routine or manage time properly when everything was online,*" highlighting the disruption of structured academic routines. Without the physical cues of a traditional classroom setting, students struggled to stay organized and on track. Informant 8 (Fatima)

echoed this sentiment, stating that *"deadlines would sneak up on me because I was not as organized without a physical schedule,"* underscoring the difficulties in tracking academic responsibilities independently. The blurred boundaries between home and academic life also contributed to heightened stress levels, as Informant 11 (Zaryn) explained: *"Balancing academic responsibilities with home life became overwhelming without clear boundaries."* This suggests that the absence of a clear separation between study time and personal life hindered students' ability to focus and maintain discipline. Furthermore, Informant 13 (Fujie) and informant 14 (Willson) emphasized persistent issues with procrastination and a lack of external accountability, which further impeded their ability to effectively manage their time. These findings point to the essential role of structure and self-discipline in remote learning environments, as well as the potential need for institutional support mechanisms to help students develop better self-regulation skills. As a result, this issue contributes to lower academic achievement, reduced learning retention, and a diminished sense of academic control. Students may feel overwhelmed or demoralized, which can lead to disengagement, lower confidence, and even attrition (Selvarajoo & Baharudin, 2023). If unaddressed, these self-regulation difficulties will continue to hinder students' ability to perform effectively in online and hybrid learning environments, highlighting the need for targeted institutional interventions such as time management training, virtual mentoring, and structured digital learning schedules in the future.

Conclusion

This study underscores the multifaceted challenges faced by students in adapting to online learning environments amid and following the COVID-19 pandemic. The findings reveal that limited social interaction and peer support, along with diminished face-to-face engagement, have significantly impacted students' motivation, sense of belonging, and overall learning experience. Technical difficulties and digital inequalities, particularly unstable internet access and device limitations, have hindered equal participation and learning continuity. Furthermore, physical and psychological effects such as screen fatigue, health problems, and mental health issues have adversely affected students' academic performance and well-being. These are also like Klimova et al., (2022) revealed that students' academic performance and well-being have been negatively impacted by physical and psychological issues such as prolonged screen time, irregular sleep patterns, and emotional exhaustion. The abrupt transition also exposed gaps in students' self-regulation and autonomous learning skills, leading to increased dropout rates and uneven skill development.

This study highlights the critical need for designing resilient, inclusive, and student-cantered online education frameworks that can effectively address these persistent challenges. The significance of these findings lies in their implications for future educational strategies. By understanding the barriers to effective online learning, educators, policymakers, and institutions can develop targeted interventions to enhance social support, improve technological infrastructure, and foster self-regulation skills among students. This knowledge is vital for creating equitable and engaging learning environments that can withstand future disruptions and support diverse student populations. Finally, this study emphasizes that addressing these core challenges is essential for ensuring the sustainability and effectiveness of online and blended learning modalities in the evolving landscape of education.

Research Contribution

The study sheds light on the difficulties students encountered with online learning in the post-pandemic period, offering valuable insights into how these experiences have affected their motivation, engagement, and academic success. It shows that social disconnection, technical issues, and screen fatigue have a strong impact on students' motivation, class participation, and academic performance. By highlighting real experiences shared by students, the study offers useful insights for instructors and university to enhance the way online learning is planned and delivered. It also points out key areas that need to be improved to make online education more fair, engaging, and effective for all students, especially those in underprivileged or remote areas.

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