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Exploring the influential factors of university students' satisfaction with online learning during the COVID-19 pandemic in malaysia: A cross-sectional study

Xin Yi Yap[1]
Shiney John[2]
Walton Wider[3,6+]
Toong Hai Sam[4]
Asokan Vasudevan[5]

[1,2,3,4,5]*Faculty of Business and Communications, INTI International University, Malaysia.*
[1]*Email: I19016766@student.newinti.edu.my*
[2]*Email: shiney.john@newinti.edu.my*
[3]*Email: walton.wider@newinti.edu.my*
[4]*Email: toonghai.sam@newinti.edu.my*
[5]*Email: asokan.vasudevan@newinti.edu.my*
[6]*School of Management, Metharath University, Pathum Thani, Thailand.*

(+ Corresponding author)

ABSTRACT

The COVID-19 pandemic has accelerated the global adoption of online learning, highlighting the importance of online education in providing educational continuity. However, factors such as poor internet connectivity and a lack of equipment have hampered the implementation of online learning in Malaysia. It is critical to address factors that influence student satisfaction in order to ensure a successful online educational process. As a result, the purpose of this study is to determine the effects of instructors, course design, technology, and environment on university students' satisfaction with online learning during the COVID-19 epidemic in Malaysia. The study's design was cross-sectional, and the research instruments were adapted from previous research. A total of 232 university students were recruited using convenience sampling, and data was collected using an online questionnaire. The findings show that course design, technology, instructors, and the environment are the best predictors of university students' satisfaction with online learning. The study adds to our understanding of the factors influencing students' satisfaction with online learning in Malaysia's education system during the COVID-19 pandemic. The findings can help educational institutions and policymakers design and implement effective online learning courses that meet the needs of students and increase their satisfaction.

Contribution/Originality: This study provides valuable insights for educational institutions seeking to enhance online learning experiences by examining the findings within the context of the Malaysian educational landscape during a global health crisis. This study enhances our comprehension of student satisfaction in online educational settings under exceptional circumstances.

1. INTRODUCTION

Since the emergence of COVID-19, when schools and universities around the world were forced to close in response to the pandemic, the importance of online education has grown (Koksal et al., 2020; Wider, Chua, Mutang, & Pan, 2023). During the pandemic, the goal of online learning is not only to complete online courses but also to maintain communication with students, increase their self-esteem, and boost their confidence in their abilities (Kaur, Dwivedi, Arora, & Gandhi, 2020). The internet's rise has dramatically increased its potential to reach students all over the world, resulting in a rich variety of media educational resources in today's online education with synchronous and asynchronous communication between instructors and students (Means, Toyama, Murphy, & Baki, 2013). The

role of information technology in education has grown in prominence in recent years, particularly during the COVID-19 pandemic. To ensure educational continuity, educational institutions worldwide have shifted to developing and launching online learning courses. Over the last decade, the rapid development of information technologies has exposed the world to new changes and a general need for retraining and learning, resulting in the widespread adoption of online learning in almost all universities (Babolan, Kia, & Derakhshanffard, 2016). During the COVID-19 pandemic, online learning has become more important than ever, as everyone, including teachers and students, needs to stay at home to complete routine tasks. This transition to online learning has presented many challenges, particularly among students, and teachers have had to adapt to using a variety of digital tools and resources to solve problems and implement new teaching and learning methods (König, Jäger-Biela, & Glutsch, 2020).

Online learning has grown in popularity among university students, with a Chegg.org survey finding that a large percentage of students in Malaysia, Canada, and China prefer online learning over traditional face-to-face learning (Karupiah, 2021). However, due to factors such as a poor Internet connection or a lack of equipment, online learning implementation in Malaysia is still moving slowly (Teoh, 2020). According to Statista (2023), 22.3% of Malaysia's population lives in rural areas, highlighting the need for improvements in the country's internet accessibility. Lack of skills, time, infrastructure, communication, and attitude are all factors that contribute to Malaysia's limited adoption of online education (O'Doherty et al., 2018). Addressing these complex reasons is therefore critical to ensuring the smooth implementation and exploration of advanced e-learning capabilities in the education sector.

According to research, student satisfaction is an important factor in facilitating a successful online educational process (Elshami et al., 2021). Students, teachers, the design of the course, and technology can all have an impact on how satisfied students are with their e-learning experience (Bradbury, Suarez-Sousa, Coquyt, Bockelmann, & Pahl, 2020). To ensure a successful educational process, the instructor has a significant impact on student satisfaction with online courses (Gopal, Singh, & Aggarwal, 2021). Further research, particularly in Malaysia, is required to bridge the research gap in understanding the effect of instructors, course design, technology, and environment on university students' satisfaction with online learning during the COVID-19 epidemic. Although many scholars from other countries have provided valuable theoretical support for students' satisfaction with online learning, Malaysia's geography, learning style, and management style may render their findings inapplicable to the current situation (Gray & DiLoreto, 2016). As a result, there is a need for research that specifically addresses Malaysia's educational system's unique circumstances and challenges (Chua, Mutang, & Wider, 2023; Wong, Cheah, & Dorai, 2023).

1.1. Underpinning Theory

Moore (1993) created Transactional Distance Theory (TDT), which Moore and Moore and Kearsley (2012) later developed to provide a framework for comprehending how learning occurs in non-classroom settings, such as online learning environments. TDT identifies three critical factors that influence students' satisfaction with online courses: course structure, conversation, and autonomy or control over one's own learning (Abuhassna et al., 2020). The structure of an online course is critical to its effectiveness. Moore (1993) defines course structure as the organisation of course content, the availability and accessibility of course materials, the frequency and quality of instructor feedback, and the use of technology to facilitate learning. The course design should be clear, organised, and simple for students to navigate. A well-designed course encourages students to interact with course materials and other students, fostering a sense of community (Moore & Kearsley, 2012). The level of interaction between instructors and students is another important factor influencing students' satisfaction with online courses. Moore (1989) classified online interactions into three types: student-student, student-instructor, and student-course content. A balance of the three types of interactions is required for effective online courses. Instructor-student interactions must be supportive, respectful, and timely. Furthermore, instructors must employ effective communication strategies such as providing feedback, asking questions, and encouraging students to participate in course content (Means et al., 2013).

Finally, in online courses, TDT emphasises the importance of autonomy, or control over one's own learning. Students must be allowed to choose how and when they learn, allowing them to take ownership of their learning experience. Self-paced learning, opportunities for self-assessment, and the use of technologies that support independent learning could all help with this (Means et al., 2013). Finally, TDT provides a theoretical framework emphasising the significance of course structure, conversation, and autonomy in facilitating effective online learning. To create engaging and effective online courses that meet the needs of students, instructors and course designers must pay close attention to these factors. Students are more likely to be satisfied with their learning experience and successfully retain the knowledge acquired if this is done.

2. LITERATURE REVIEW

2.1. Students' Satisfaction

Multiple factors influence online learning satisfaction, and student satisfaction is a key theme when evaluating online learning (Alqurashi, 2019). According to research, interaction quality, which includes instructor feedback and student-student interaction, is a significant factor in learning satisfaction (Kuo, Walker, Belland, Schroder, & Kuo, 2014). Furthermore, prior online course experience, electronic competencies of students and instructors, and attitudes towards online learning should all be considered when assessing satisfaction (Freeman & Urbaczewski, 2019). Instructors must identify all critical variables, such as course design, instructor quality, and communication, in order to improve satisfaction with online learning (Gopal et al., 2021). Numerous studies have examined the factors that influence students' satisfaction with online learning, and key factors include the role of the instructor, interaction between instructors and students, the nature of the course structure, course content, technology, learner motivation, learner efficacy, self-regulated learning, learning environment, and assessment methods (Eom, Wen, & Ashill, 2006). These factors have been classified by researchers as communication dynamics, online learning environment factors, organisational factors, and personality and situational factors (Yunusa & Umar, 2021). According to Zeng and Wang (2021), the same factors can identify student satisfaction in emergency distance teaching. The various determinant factors of student satisfaction in this study were classified into four categories: instructors, course design, technology, and environment. Systematic research on student satisfaction can improve student performance, practises for online teaching, and students' academic curriculum retention (Cole, Shelley, & Swartz, 2014). It is a critical component in determining the effectiveness of online learning (Alqurashi, 2019), and teachers and students are becoming increasingly important in increasing student satisfaction with online learning through successful outcomes as a result of the COVID-19 outbreak (Li & Lalani, 2020).

2.2. Instructor and Students' Satisfaction

The quality of instructors in online education is critical to determining student satisfaction and success. This is due to the fact that their performance in the online education process is closely related to the integration and implementation of their technological capabilities, as well as the development of their quality (Malik, 2010). High levels of interaction with instructors, learners, or content have consistently been shown in studies to lead to high levels of satisfaction and engagement in online learning (Kuo et al., 2014; Veletsianos, 2010). In contrast, a lack of interaction reduces student engagement and satisfaction (Martin, Wang, & Sadaf, 2018; She, Ma, Jan, Sharif Nia, & Rahmatpour, 2021). It can be concluded that online learning interaction leads to student participation in academic activities, which has a positive impact on student satisfaction (Kim & Kim, 2021). The instructor's attitude towards online learning is critical to the successful implementation of online education (Yang & Cornelious, 2005). The instructor's teaching style, approach to teaching in a friendly manner, and provision of quality content are all important factors influencing student satisfaction with online education (Webster & Hackley, 1997). Furthermore, instructors' friendliness towards students, the clarity of students' questions, the correct understanding of IT, and the persuasiveness of interactions between instructors and students all have an impact on student satisfaction (Volery &

Lord, 2000). According to research, if a university wants to improve student satisfaction, it should prioritise improving quality indicators of technology systems, such as the strategies instructors use to allow for student engagement and effective learning (Jiménez-Bucarey et al., 2021). Value-added models, classroom observations, principal assessments, classroom artefact analysis, portfolios, practise self-reports, and student evaluations are among the tools available to assess instructor quality (Little, Goe, & Bell, 2009). As a result, we hypothesised:

H₁: The instructor positively affects university students' satisfaction with online learning in Malaysia during the COVID-19 epidemic.

2.3. Course Design and Students' Satisfaction

Inadequate course design leads to students spending excessive time and effort searching for course portals, detracting from their ability to absorb knowledge. This includes the need to locate resources such as assessment submission platforms and video recordings (Placencia & Muljana, 2019). Previous studies have indicated that course design significantly impacts student satisfaction (Mason & Weller, 2000; Santally, Rajabalee, Sungkur, Maudarbocus, & Greller, 2020). According to Lee (2014), there are two main factors that affect student satisfaction: human factors like the instructor's familiarity with the course material and design factors like the course structure and technical aspects. Students value clear assignment guidelines and rubrics as important aspects of online learning, particularly in relation to the overall course structure. Given that not all students have advanced technological skills, the presence of a user-friendly system affects the level of student satisfaction (Zamri, Omar, Anwar, & Fatzel, 2021). Li, Marsh, and Rienties (2016) found that course design significantly influences satisfaction with online learning. Gopal et al. (2021) found that course design positively impacts student performance and satisfaction in online learning. This is because it ensures that essential information, such as course content, educational objectives, course structure, and course output, is consistently provided to help students understand the benefits of the online learning system. According to Almaiah and Alyoussef (2019), this circumstance allows students to utilize the system, leading to enhanced academic performance and increased satisfaction. As a result, we hypothesised:

H₂: Course design positively affects university students' satisfaction with online learning in Malaysia during the COVID-19 epidemic.

2.4. Technology and Students' Satisfaction

Findik-Coşkunçay, Alkiş, and Özkan-Yildirim (2018) argue that current studies on online learning have predominantly concentrated on the technical aspects of information technology, neglecting the social and student-related factors. Gaining insight into the factors that impact university students' satisfaction with online learning from their own perspectives can contribute to enhancing and optimizing online learning environments. This study aims to develop a validated conceptual framework that includes technology as a factor affecting university students' satisfaction with online learning during the COVID-19 pandemic in Malaysia. Harsasi and Sutawijaya (2018) found a positive relationship between student satisfaction and factors such as online course design, flexibility, and the quality of information and communication technology (ICT) and computing. Barbera, Clara, and Linder-Vanberschot (2013) highlighted the importance of technology in their study. They recommended that future research should focus on examining how technology platforms affect satisfaction and perceived learning. In order to ensure successful implementation of e-learning and enhance student satisfaction, online learning requires the utilization of diverse tools, including video meetings, audio, and text-based chat. It is crucial that these technical attributes exhibit a high level of quality (Webster & Hackley, 1997). Malik (2010) found that factors such as improved internet quality, adequate technical support, and the quality of online courses contribute positively to students' satisfaction with e-learning. Difficulties with login and logout as well as the speed of network data transmission from host servers may have an impact on learner satisfaction.

Karim, Haque, Ulfy, and Hossin (2021) conducted a study on 483 participants in Klang Valley, Malaysia. The study found that technology plays a crucial role for university students during the pandemic and that online learning without adequate technology is unsatisfactory. Khan, Nabi, Khojah, and Tahir (2020) argue that the technology dimension is crucial for a satisfactory online learning experience. To foster student engagement and facilitate an interactive learning environment, online courses can incorporate interactive features such as discussion rooms and chat rooms. Live collaboration technologies like Zoom, Microsoft Teams, and Google Meet enhance effective communication among students and instructors, leading to increased satisfaction with online learning (Kornpitack & Sawmong, 2022). The advancement of technology contributes to increased student interest and satisfaction with the online learning system, indicating its success. Therefore, it is hypothesized that:

H_3: *Technology positively affects university students' satisfaction with online learning in Malaysia during the COVID-19 epidemic.*

2.5. Environment and Students' Satisfaction

Thurmond, Wambach, Connors, and Frey (2002) argued that environmental factors, such as diverse assessments and online discussions in the classroom, can greatly influence satisfaction with online learning. The implementation of diverse assessment methods in online learning platforms fosters a sense of instructor-student connection and ensures effective evaluation of learners' efforts (Chen, Bennett, & Maton, 2008). Stefanovic et al. (2011) found that the diversity of assessments and interactions in the online learning environment significantly affects student satisfaction. Using multiple assessment methods can enhance instructors' ability to motivate students and promote their engagement in online learning activities. Instructors should consider these factors when utilizing e-learning methods to promote and enhance academic performance. Therefore, we formulated a hypothesis:

H_4. *Environmental factors positively affect university students' satisfaction with online learning in Malaysia during the COVID-19 epidemic.*

3. METHODS

3.1. Sample

This was a questionnaire-based, cross-sectional study. Convenience sampling was used to recruit 232 university students who participated in online learning during the COVID-19 epidemic in Malaysia. Because of the time constraints of covering a large population, this study used G*Power analysis to determine the sample size required. The significance level was set at 0.05, the power at 0.95, the effect size at 0.15, and the number of predictors at four. As a result, the total sample size for this study is 129. As a result, our research sample of 232 is deemed statistically sufficient.

Table 1. Demographic profile of respondents (N=232).

Demographics	Categories	Frequency	Percent (%)
Gender	Female	122	52.6
	Male	110	47.4
	Total	232	100
Age	18-20	7	3
	21-25	208	89.7
	26-30	17	7.3
	Total	232	100
Level of education	Diploma	9	3.9
	Degree	194	83.6
	Master	29	12.5
	Total	232	100

Table 1 displays the respondents' demographic information. In terms of gender, the majority were females, with 110 respondents (52.6%), and 110 respondents were males (47.4%). In terms of age, the majority of respondents (89.7%) were between the ages of 21 and 25, with only 3 (3%) in the 18–20 age group and 17 (7.3%) in the 26–30 age group. In terms of education, the data show that the majority of respondents (83.6%) had a bachelor's degree, with 29 (12.5%) holding a master's degree and only 9 (3.9%) having a diploma level of education.

3.2. Measurement

Section A includes a sample of respondents' demographic information, such as gender, age, and level of education. The independent and dependent variables are included in Section B. Each question was graded on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The constructs of student satisfaction, instructor, and course design are made up of four items each, which were adapted from Gopal et al. (2021). The technology and environmental constructs were adapted from Stefanovic et al. (2011). Cronbach alpha values range from 0.951 to 0.963.

3.3. Data Analysis

The IBM Statistical Package for Social Sciences (SPSS) Version 26.0 was used to analyse the data. The descriptive analysis was applied to the demographic information of the respondents and research variables. Correlation and multiple linear regression are used to test the strength of the relationship between variables in order to answer the study's objectives.

4. RESULTS

Table 2 displays the results of a Pearson correlation analysis between instructors, course design, technology, environment, and student satisfaction. There was a significant positive and strong correlation between instructor and student satisfaction ($r = .919$, $p < .01$). The results of this study indicate that the quality of the instructor plays a significant and positive role in student satisfaction with online learning. The course design also has a significant positive and strong correlation with student satisfaction ($r = .931$, $p < .01$). This finding bolstered the notion that a well-organised course is critical for student satisfaction. Technology and student satisfaction had a significant and strong positive relationship ($r = .918$, $p < .01$). This indicates that efficient online learning technologies are critical to student satisfaction. Lastly. The environment and student satisfaction have a significant and strong correlation ($r = .918$, $p < .01$). This suggests that a learning environment that encourages a variety of learning modes is critical to student satisfaction. The category with the highest mean score was student satisfaction (M = 3.35), followed by technology (M = 3.34), course design (M = 3.32), the environment (M = 3.31), and the instructors (M = 3.29).

Table 2. Inter-correlation, means, and standard deviation for variables (N=232).

No.	Variables	M (SD)	1	2	3	4	5
1	Student satisfaction	3.35 (1.34)	1				
2	Instructor	3.29 (1.31)	0.919**	1			
3	Course design	3.32 (1.32)	0.931**	0.936**	1		
4	Technology	3.34 (1.36)	0.918**	0.927**	0.923**	1	
5	Environmental	3.31 (1.34)	0.918**	0.919**	0.948**	0.926**	1

Note: **p < 0.05.

Table 3 displays the results of a multiple linear regression analysis examining the predictors of student satisfaction. According to the findings, the combination of instructors, course design, technology, and environment explained 89.7% of the variance in student satisfaction. The strongest predictor of student satisfaction was found to be course design (beta = 0.343, $p < 0.01$), followed by technology (beta = 0.250, $p < 0.01$), instructors (beta = 0.218, $p < 0.05$), and environment (beta = 0.162, $p < 0.05$). Hypotheses H1, H2, H3, and H4 are thus supported.

Table 3. Predictors of job satisfaction (n = 162).

Criterion variable	Predictor variable	F	R^2	df	Beta	t	p
Student satisfaction	Instructor	494.351**	0.897	-4,227	0.218	3.161	0.002
	Course design				0.343	4.324	0.000
	Technology				0.25	3.777	0.000
	Environmental				0.162	2.192	0.029

Note: **p < .001.

5. DISCUSSION

This study aims to investigate the impact of instructors, course design, technology, and environment on the satisfaction levels of Malaysian university students with online learning during the COVID-19 pandemic. The findings indicate that all four independent variables positively influence university student satisfaction in Malaysia. Following technology, instructors, and environmental factors, course design was the most important factor.

Based on recent research, it has been determined that the design of the course is the most influential factor in determining the level of satisfaction that university students experience with online learning. This finding is in line with earlier research by Gopal et al. (2021). Consistently providing essential information, such as course content, educational objectives, course structure, and course outcomes, is of utmost importance. Almaiah and Alyoussef (2019) discovered that the course design that enables students to use the system effectively has a positive impact on their perception of online learning, which results in increased satisfaction and improved performance. Course structure encompasses the utilization and design of course resources, instructional strategies, methods, course scheduling, and course planning throughout the entire course delivery process (Garrison, Anderson, & Archer, 1999). The course structure should encompass assignment expectations, deadlines, guidelines, assessment rules, and resources to support students' academic success and ongoing learning. According to Moore (1991), the course structure is an important factor that affects students' perceptions of online courses. It encompasses the goals and expectations of the course, which are designed to support and enhance student learning. The course framework should be comprehensive, well-structured, and aligned with the educational objectives of the students (Eom et al., 2006). Educators who lack technical expertise in implementing dynamic lessons may seek additional training, support, and guidance from course designers (Vargas, 2014). The level of usability can impact students' satisfaction with online courses. The satisfaction of students with their online course learning is positively correlated with the organization and logical structure of the course outline.

The study's findings indicate that technology is the second most influential factor in university students' satisfaction with online learning. This finding is consistent with prior studies conducted by Harsasi and Sutawijaya (2018), Karim et al. (2021), and Kornpitack and Sawmong (2022). The study found that user-friendly and intuitive technology enhances accessibility and student satisfaction in online learning. Dubey, Sahu, and Pradhan (2020) argue that online material should prioritize ease of use prior to its widespread dissemination. According to Dubey et al. (2020), it is important for web pages to be easily accessible, smartphones to have user-friendly interfaces, and electronic content to be easily accessible in order to enhance compatibility with technology. To succeed, students require access to reliable devices and familiarity with the technology utilized in the online course (Belanger & Jordan, 2000). Students with limited online time have an advantage over those with unrestricted access (Wegerif, 1998). Internet accessibility significantly impacts student satisfaction (Bower & Kamata, 2000). Hara (2000) found that students who express dissatisfaction with the technology used in online courses tend to have lower levels of satisfaction with the course.

Reliable equipment is essential for both students and institutions. In addition, it is essential for students to possess practical and effective tools for engagement and interaction, which should be utilized on a regular basis (Alqurashi, 2019). To enhance engagement in online classes, it is imperative to provide online students with ample opportunities for participation in discussions.

Our research found a positive correlation between instructor quality and student satisfaction among university students in Malaysia during the COVID-19 pandemic. This finding aligns with prior studies (Jiménez-Bucarey et al., 2021; She et al., 2021). The instructor plays a crucial role in online learning due to its novelty for students (Picciano, 2002). The instructors' role in providing instructional scaffolding is crucial due to variations in students' levels of autonomy (Yacoba, Kadirb, Zainudinc, & Zurairahd, 2012). In order for students to acquire knowledge and skills, it is necessary to provide scaffolding instruction and descriptive feedback. In online learning, instructors play a crucial role in enhancing learning outcomes by guiding, assisting, and motivating students, offering timely feedback, and facilitating student interaction (Yengin, Karahoca, Karahoca, & Yücel, 2010). High-quality teaching positively impacts students by promoting independence and fostering a sense of pride in their abilities. Online course instructors will face additional responsibilities during the COVID-19 pandemic. In addition to enhancing their technical skills and instructing others, individuals must also possess adaptability to effectively navigate unforeseen changes in their environment. According to Darling-Hammond (2010), faculty standards in higher education refer to the requirements for personal traits that faculty members must possess before they are qualified to teach. The combination of content knowledge, pedagogical knowledge, attitudes, and experience affects a teacher's effectiveness. Proficient instructors can provide extensive knowledge to their students (Martin, 2020).

Finally, our research found that environmental factors affect student satisfaction. This finding is consistent with previous research (Chen et al., 2008; Stefanovic et al., 2011). Because each online learning student has different needs and constraints, it is necessary to examine each interactive environment separately, especially if social interaction is lacking. Students' ability to combine ideas into cohesive concepts can be enhanced through more directed learning from teachers and strong student collaboration (Stefanovic et al., 2011). The course can be modified to cover most areas of the traditional classroom environment and provide a high-quality, satisfying educational experience for online learners by establishing these essential concepts and incorporating new technology delivery approaches (Strong, Irby, Wynn, & McClure, 2012).

6. RECOMMENDATIONS

As a result of the COVID-19 pandemic, online education has become more prevalent in recent years. The design of a course is critical to the success of online learning. Furthermore, a user-friendly system is essential for students who are not tech-savvy. Teachers must organise course material so that students can comprehend it easily (Gopal et al., 2021). Effective communication is also essential for student satisfaction in online learning. Students are more likely to give courses and teachers satisfactory ratings if they effectively communicate with them, facilitate their learning, plan the course efficiently, show an interest in their learning progress, treat them with respect, and accurately evaluate their work. Instructors must be present and actively involved in their classes, provide well-structured lessons, and encourage student participation to ensure a positive student view of learning and satisfaction (Eom et al., 2006).

Furthermore, providing courses with opportunities for student interaction, in addition to high levels of instructor involvement, has a positive effect on student satisfaction (Gray & DiLoreto, 2016). It is critical for instructors to understand students' expectations and tailor course material to their needs (Gopal et al., 2021). Personalized interactions with students are also important in assisting them to overcome obstacles and succeed in online learning. Effective communication and engagement are critical for creating a positive learning environment in online classes. Instructors can encourage online discussions by asking engaging questions that reflect a variety of perspectives. Praise for students' abilities and knowledge can also encourage them to participate more actively in online discussions. Furthermore, personal stories from instructors' lives can make lessons more relatable and assist students with their academic work. Assessment approaches are critical in ensuring that students' learning efforts are appropriately evaluated and that they feel connected with the teacher. Using multiple assessment approaches can motivate students to do their best in various assessment scenarios, resulting in conscientious and effective online learning activities.

Teachers should also collect appropriate feedback after teaching in order to plan future lessons and develop future strategies.

7. CONCLUSION, LIMITATIONS, AND FUTURE RECOMMENDATIONS

This study aimed to determine the factors that impact the satisfaction of university students with online learning in Malaysia during the COVID-19 pandemic. The study involved 232 university students from Malaysia. The results indicated that instructors, course design, technology, and environmental factors had a positive impact on students' satisfaction with online learning. This study aims to enhance the educational industry's understanding of the factors influencing students' satisfaction with online learning. It specifically examines the utilization of online learning and its potential benefits for educational institutions. The study's findings align with Moore's Transactional Distance Theory, which highlights the significance of course structure, conversation, and autonomy in promoting successful online learning. The study indicates that environmental factors can impact students' satisfaction with online learning. This underscores the significance of educational institutions taking into account a wider array of factors during the development and execution of online learning courses. A small sample size, scarce resources, and a brief timeframe limit the study. The collected data may exhibit bias and lack generalizability to other populations. Future research should aim to increase the sample size and gather data from additional locations within Malaysia and other countries in order to gain a more comprehensive understanding of students' perspectives. Future research may consider incorporating the viewpoints of instructors and policymakers, as well as employing longitudinal studies and qualitative research methodologies. Additionally, future studies could explore the performance of instructors in comparable circumstances and the influence of home environment factors on student satisfaction.

REFERENCES

Abuhassna, H., Al-Rahmi, W. M., Yahya, N., Zakaria, M. A. Z. M., Kosnin, A. B. M., & Darwish, M. (2020). Development of a new model on utilizing online learning platforms to improve students' academic achievements and satisfaction. *International Journal of Educational Technology in Higher Education*, *17*(1), 1-23. https://doi.org/10.1186/s41239-020-00216-z

Almaiah, M. A., & Alyoussef, I. Y. (2019). Analysis of the effect of course design, course content support, course assessment and instructor characteristics on the actual use of E-learning system. *Ieee Access*, *7*, 171907-171922. https://doi.org/10.1109/access.2019.2956349

Alqurashi, E. (2019). Predicting student satisfaction and perceived learning within online learning environments. *Distance Education*, *40*(1), 133-148. https://doi.org/10.1080/01587919.2018.1553562

Babolan, A. Z., Kia, M. M., & Derakhshanffard, S. (2016). *The role of elearning in higher education system and its challenges*. Paper presented at the In the First International Conference on Modern Research in the Field of Education Sciences and Psychology and Social Studies of Iran, Qom, International Institute for the Study of Middle East Science.

Barbera, E., Clara, M., & Linder-Vanberschot, J. A. (2013). Factors influencing student satisfaction and perceived learning in online courses. *E-learning and Digital Media*, *10*(3), 226-235. https://doi.org/10.2304/elea.2013.10.3.226

Belanger, F., & Jordan, D. H. (2000). *Evaluation and implementation of distance learning: Technologies, tools, and techniques*. Hershey, PA: Idea Group Pub.

Bower, B. L., & Kamata, A. (2000). Factors influencing student satisfaction with online courses. *Academic Exchange Quarterly, 4*(3), 52-52.

Bradbury, B. L., Suarez-Sousa, X. P., Coquyt, M., Bockelmann, T. L., & Pahl, A. L. (2020). Teaching under crisis: Impact and implications of the COVID-19 pandemic on education in Minnesota. *The Interactive Journal of Global Leadership and Learning, 1*(2), 1-80. https://doi.org/10.55354/2692-3394.1018

Chen, R. T. H., Bennett, S., & Maton, K. (2008). The adaptation of Chinese international students to online flexible learning: Two case studies. *Distance Education, 29*(3), 307-323. https://doi.org/10.1080/01587910802395821

Chua, B. S., Mutang, J. A., & Wider, W. (2023). Predictors of the well-being of secondary school students during the home-based teaching and learning. *International Journal of Education and Practice, 11*(3), 529-539.

Cole, M. T., Shelley, D. J., & Swartz, L. B. (2014). Online instruction, E-learning, and student satisfaction: A three year study. *International Review of Research in Open and Distance Learning, 15*(6), 111-131. https://doi.org/10.19173/irrodl.v15i6.1748

Darling-Hammond, L. (2010). *Evaluating teacher effectiveness: How teacher performance assessments can measure and improve teaching.* Washington, DC: Center for American Progress.

Dubey, D., Sahu, K. K., & Pradhan, R. (2020). Factors affecting student's satisfaction on technology-enhanced learning in higher education. *Journal of Xi'an University of Architecture & Technology, 12*(4), 625-634.

Elshami, W., Taha, M. H., Abuzaid, M., Saravanan, C., Al Kawas, S., & Abdalla, M. E. (2021). Satisfaction with online learning in the new normal: Perspective of students and faculty at medical and health sciences colleges. *Medical Education Online, 26*(1), 1920090. https://doi.org/10.1080/10872981.2021.1920090

Eom, S. B., Wen, H. J., & Ashill, N. (2006). The determinants of students' perceived learning outcomes and satisfaction in university online education: An empirical investigation. *Decision Sciences Journal of Innovative Education, 4*(2), 215-235. https://doi.org/10.1111/j.1540-4609.2006.00114.x

Findik-Coşkunçay, D., Alkiş, N., & Özkan-Yildirim, S. (2018). A structural model for students' adoption of learning management systems: An empirical investigation in the higher education context. *Journal of Educational Technology & Society, 21*(2), 13-27.

Freeman, L., & Urbaczewski, A. (2019). Critical success factors for online education: Longitudinal results on program satisfaction. *Communications of the Association for Information Systems, 44*(1), 630-645. https://doi.org/10.17705/1cais.04430

Garrison, D. R., Anderson, T., & Archer, W. (1999). Critical inquiry in a text-based environment: Computer conferencing in higher education. *The Internet and Higher Education, 2*(2-3), 87-105. https://doi.org/10.1016/s1096-7516(00)00016-6

Gopal, R., Singh, V., & Aggarwal, A. (2021). Impact of online classes on the satisfaction and performance of students during the pandemic period of COVID 19. *Education and Information Technologies, 26*(6), 6923-6947. https://doi.org/10.1007/s10639-021-10523-1

Gray, J. A., & DiLoreto, M. (2016). The effects of student engagement, student satisfaction, and perceived learning in online learning environments. *International Journal of Educational Leadership Preparation, 11*(1), 1–20.

Hara, N. (2000). Student distress in a web-based distance education course. *Information, Communication & Society, 3*(4), 557-579. https://doi.org/10.1080/13691180010002297

Harsasi, M., & Sutawijaya, A. (2018). Determinants of student satisfaction in online tutorial: A study of a distance education institution. *Turkish Online Journal of Distance Education, 19*(1), 89-99. https://doi.org/10.17718/tojde.382732

Jiménez-Bucarey, C., Acevedo-Duque, Á., Müller-Pérez, S., Aguilar-Gallardo, L., Mora-Moscoso, M., & Vargas, E. C. (2021). Student's satisfaction of the quality of online learning in higher education: An empirical study. *Sustainability, 13*(21), 11960. https://doi.org/10.3390/su132111960

Karim, M. W., Haque, A., Ulfy, M. A., & Hossin, M. S. (2021). Factors influencing student satisfaction towards distance learning apps during the coronavirus (Covid-19) pandemic in Malaysia. *International Journal of Academic Research in Progressive Education and Development, 10*(2), 245-260. https://doi.org/10.6007/ijarped/v10-i2/9546

Karupiah, S. M. (2021). *Online learning is here to stay new straits times.* Retrieved from https://www.nst.com.my/opinion/letters/2021/04/683668/online-learning-here-stay

Kaur, N., Dwivedi, D., Arora, J., & Gandhi, A. (2020). Study of the effectiveness of e-learning to conventional teaching in medical undergraduates amid COVID-19 pandemic. *National Journal of Physiology, Pharmacy and Pharmacology, 10*(7), 563-567. https://doi.org/10.5455/njppp.2020.10.04096202028042020

Khan, M. A., Nabi, M. K., Khojah, M., & Tahir, M. (2020). Students' perception towards e-learning during COVID-19 pandemic in India: An empirical study. *Sustainability, 13*(1), 1-14. https://doi.org/10.3390/su13010057

Kim, S., & Kim, D.-J. (2021). Structural relationship of key factors for student satisfaction and achievement in asynchronous online learning. *Sustainability, 13*(12), 6734. https://doi.org/10.3390/su13126734

Koksal, E., Dost, B., Terzi, Ö., Ustun, Y. B., Özdin, S., & Bilgin, S. (2020). Evaluation of depression and anxiety levels and related factors among operating theater workers during the novel coronavirus (COVID-19) pandemic. *Journal of PeriAnesthesia Nursing, 35*(5), 472-477.

König, J., Jäger-Biela, D. J., & Glutsch, N. (2020). Adapting to online teaching during COVID-19 school closure: Teacher education and teacher competence effects among early career teachers in Germany. *European Journal of Teacher Education, 43*(4), 608-622. https://doi.org/10.1080/02619768.2020.1809650

Kornpitack, P., & Sawmong, S. (2022). Empirical analysis of factors influencing student satisfaction with online learning systems during the COVID-19 pandemic in Thailand. *Heliyon, 8*(3), e09183. https://doi.org/10.1016/j.heliyon.2022.e09183

Kuo, Y.-C., Walker, A. E., Belland, B. R., Schroder, K. E., & Kuo, Y.-T. (2014). A case study of integrating Interwise: Interaction, internet self-efficacy, and satisfaction in synchronous online learning environments. *International Review of Research in Open and Distributed Learning, 15*(1), 161-181. https://doi.org/10.19173/irrodl.v15i1.1664

Lee, J. (2014). An exploratory study of effective online learning: Assessing satisfaction levels of graduate students of mathematics education associated with human and design factors of an online course. *International Review of Research in Open and Distributed Learning, 15*(1), 111-132. https://doi.org/10.19173/irrodl.v15i1.1638

Li, C., & Lalani, F. (2020). *The COVID-19 pandemic has changed education forever this is how world economic forum.* Retrieved from https://www.weforum.org/agenda/2020/04/coronavirus-education-global-covid19-online-digital-learning/

Li, N., Marsh, V., & Rienties, B. (2016). Modelling and managing learner satisfaction: Use of learner feedback to enhance blended and online learning experience. *Decision Sciences Journal of Innovative Education, 14*(2), 216-242. https://doi.org/10.1111/dsji.12096

Little, O., Goe, L., & Bell, C. (2009). *A practical guide to evaluating teacher effectiveness. National Comprehensive Center for Teacher Quality.*

Malik, M. W. (2010). Factor effecting learner's satisfaction towards e-learning: A conceptual framework. *OIDA International Journal of Sustainable Development, 2*(3), 77-82.

Martin, A. M. (2020). Instructor qualities and student success in higher education online courses. *Journal of Digital Learning in Teacher Education, 37*(1), 65-80. https://doi.org/10.1080/21532974.2020.1815106

Martin, F., Wang, C., & Sadaf, A. (2018). Student perception of helpfulness of facilitation strategies that enhance instructor presence, connectedness, engagement and learning in online courses. *The Internet and Higher Education, 37*, 52-65. https://doi.org/10.1016/j.iheduc.2018.01.003

Mason, R., & Weller, M. (2000). Factors affecting students' satisfaction on a web course. *Educational Technology, 16*(2), 173-200. https://doi.org/10.14742/ajet.1830

Means, B., Toyama, Y., Murphy, R., & Baki, M. (2013). The effectiveness of online and blended learning: A meta-analysis of the empirical literature. *Teachers College Record, 115*(3), 1-47. https://doi.org/10.1177/016146811311500307

Moore, M. (1993). Theory of transactional distance. In D. Keegan (Ed.), Theoretical Principles of Distance Education. In (pp. 22–38). London: Routledge.

Moore, M. G. (1989). Three types of interaction. *The American Journal of Distance Education, 3*(2), 1-6. https://doi.org/10.1080/08923648909526659

Moore, M. G. (1991). Editorial: Distance education theory. *The American Journal of Distance Education*, *5*(3), 1-6. https://doi.org/10.1080/08923649109526758

Moore, M. G., & Kearsley, G. (2012). *Distance education: A systems view of online learning* (3rd ed.). Wadsworth: Cengage Learning.

O'Doherty, D., Dromey, M., Lougheed, J., Hannigan, A., Last, J., & McGrath, D. (2018). Barriers and solutions to online learning in medical education–an integrative review. *BMC Medical Education*, *18*(1), 1-11. https://doi.org/10.1186/s12909-018-1240-0

Picciano, A. G. (2002). Beyond student perceptions: Issues of interaction, presence, and performance in an online course. *Journal of Asynchronous Learning Networks*, *6*(1), 21-40. https://doi.org/10.24059/olj.v6i1.1870

Placencia, G., & Muljana, P. (2019). *The effects of online course design on student course satisfaction American society for engineering education, pacific Southwest section meeting*. Los Angeles: California State University.

Santally, M. I., Rajabalee, Y. B., Sungkur, R. K., Maudarbocus, M. I., & Greller, W. (2020). Enabling continuous improvement in online teaching and learning through e-learning capability and maturity assessment. *Business Process Management Journal*, *26*(6), 1687-1707. https://doi.org/10.1108/bpmj-11-2018-0335

She, L., Ma, L., Jan, A., Sharif Nia, H., & Rahmatpour, P. (2021). Online learning satisfaction during COVID-19 pandemic among Chinese university students: The serial mediation model. *Frontiers in Psychology*, *12*, 743936. https://doi.org/10.3389/fpsyg.2021.743936

Statista. (2023). *Share of rural population in Malaysia from 2007 to 2021 statista research department*. Retrieved from https://www.statista.com/statistics/760965/malaysia-share-of-rural-population/

Stefanovic, D., Drapsin, M., Nikolic, J., Scepanovic, D., Radjo, I., & Drid, P. (2011). Empirical study of student satisfaction in e-learning system environment. *Technics Technologies Education Management*, *6*(4), 1152-1164.

Strong, R., Irby, T. L., Wynn, J. T., & McClure, M. M. (2012). Investigating students' satisfaction with elearning courses: The effect of learning environment and social presence. *Journal of Agricultural Education*, *53*(3), 98-110.

Teoh, M. (2020). *Barriers to learning online the star*. Retrieved from https://www.thestar.com.my/lifestyle/family/2020/11/20/barriers-to-online-learning

Thurmond, V. A., Wambach, K., Connors, H. R., & Frey, B. B. (2002). Evaluation of student satisfaction: Determining the impact of a web-based environment by controlling for student characteristics. *The American Journal of Distance Education*, *16*(3), 169-190. https://doi.org/10.1207/s15389286ajde1603_4

Vargas, J. (2014). What can online course designers learn from research on machine-delivered instruction. *Academe*, *100*(3), 8-12.

Veletsianos, G. (2010). *Emerging technologies in distance education*. Athabasca: University Press.

Volery, T., & Lord, D. (2000). Critical success factors in online education. *International Journal of Educational Management*, *14*(5), 216-223. https://doi.org/10.1108/09513540010344731

Webster, J., & Hackley, P. (1997). Teaching effectiveness in technology-mediated distance learning. *Academy of Management Journal*, *40*(6), 1282-1309.

Wegerif, R. (1998). The social dimension of asynchronous learning networks. *Journal of Asynchronous Learning Networks*, *2*(1), 34-49. https://doi.org/10.24059/olj.v2i1.1928

Wider, W., Chua, B. S., Mutang, J. A., & Pan, L. C. (2023). Secondary school students' school-related stressors during the coronavirus disease (COVID-19) pandemic in Sabah, Malaysia. *Frontiers in Education*, *8*, 1138226. https://doi.org/10.3389/feduc.2023.1138226

Wong, T. A., Cheah, W. C., & Dorai, B. J. (2023). Emergency remote teaching (ERT) during the Covid-19 pandemic: A case study of experiences and challenges of lecturers. *Higher Education, Skills and Work-Based Learning*, *13*(3), 575-586.

Yacoba, A., Kadirb, A. Z. A., Zainudinc, O., & Zurairahd, A. (2012). Student awareness towards e-learning in education. *Procedia-Social and Behavioral Sciences*, *67*, 93-101. https://doi.org/10.1016/j.sbspro.2012.11.310

Yang, Y., & Cornelious, L. F. (2005). Preparing instructors for quality online instruction. *Online Journal of Distance Learning Administration*, *8*(1), 1-16.

Yengin, İ., Karahoca, D., Karahoca, A., & Yücel, A. (2010). Roles of teachers in e-learning: How to engage students & how to get free e-learning and the future. *Procedia-Social and Behavioral Sciences, 2*(2), 5775-5787. https://doi.org/10.1016/j.sbspro.2010.03.942

Yunusa, A. A., & Umar, I. N. (2021). A scoping review of critical predictive factors (CPFs) of satisfaction and perceived learning outcomes in e-learning environments. *Education and Information Technologies, 26,* 1223-1270. https://doi.org/10.1007/s10639-020-10286-1

Zamri, N., Omar, N. B., Anwar, I. S. K., & Fatzel, F. H. M. (2021). Factors affecting students' satisfaction and academic performance in open & distance learning. *International Journal of Academic Research in Business and Social Sciences, 11*(11), 1–16. https://doi.org/10.6007/ijarbss/v11-i11/11194

Zeng, X., & Wang, T. (2021). College student satisfaction with online learning during COVID-19: A review and implications. *International Journal of Multidisciplinary Perspectives in Higher Education, 6*(1), 182-195.