Online Video Usage in Undergraduate Research Presentations and Learning Satisfaction: A Comparative Study of Male and Female Students

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Abstract: *The academic field is an important learning platform in a country's education system and students are valuable assets to the country. The primary purpose of this study was to identify gender-related differences in the relationships among perceived usefulness, perceived ease of use, attitude, need for achievement, and learning satisfaction with the use of online videos for undergraduate research project presentations. Specifically, this paper studies the mediating effect of the need for achievement on the proposed relationships. The study employed a cross-sectional survey with systematic sampling. The data were collected from 200 students at the Faculty of Administrative Science and Policy Studies, Universiti Teknologi MARA (UiTM). The model was tested using Structured Equation Modelling (SEM). The findings can be summarised as follows: (i) both female and male students' learning satisfaction is influenced by perceived usefulness, perceived ease of use, and attitude, and (ii) both males and females are expected to have a high need for achievement, with female students requiring a more goal-oriented personality than male students to perform well in their learning. The findings provide practical support for the development of new educational strategies to assist universities, faculties, and higher learning institutions in enhancing their existing student development programs or projects.*

Keywords: *perceived usefulness; perceived ease of use; attitude; need for achievement; learning satisfaction*

1.0 INTRODUCTION

Many studies have been conducted to examine student satisfaction with the use of equipment or applications for online learning. Alqurashi (2019) measured student satisfaction based on the class atmosphere, relationships among students, and student-and-lecturer relationships. Student satisfaction is assessed through students' perception of the value of learning, experience, self-development, and the desire to take similar courses. A study by Quadir and Zhou (2021), which measured student satisfaction through the features of the platform used for synchronous online learning, found that features of the platform that are attractive and comfortable to use could influence student satisfaction with online learning. Universiti Teknologi MARA (UiTM) has actively utilized an online learning platform since the COVID-19 pandemic. UiTM has used online platforms for both the pandemic and post-pandemic undergraduate viva presentations at the Faculty of Administrative Science and Policy Studies. Therefore, this research initiative was conducted to survey student satisfaction with online video presentations.

To determine the factors influencing students' satisfaction with online presentation, the Technology Acceptance Model (TAM) was referenced. The TAM model is often used to explain the acceptance of technology and information systems (Alfadda & Mahdi, 2021). Davis (1989) introduced the TAM to explain user acceptance of computer technology based on clear theoretical justification. Two constructs related to internal beliefs, which are critical determinants in TAM, are perceived usefulness and perceived ease of use (Yadav & Shanmugam, 2024). Thus, the first two factors influencing student satisfaction with online presentations are perceived usefulness and ease of use. The third factor is students' attitude toward the use of technology, which measures the seriousness with which students approach tasks that are meaningful through video presentations.

This study also examines the mediating effect of the need for achievement on the relationships between perceived usefulness, perceived ease of use, attitude, and student learning satisfaction. The need for achievement refers to the desire to take on difficult tasks, where people with a high need for

achievement have control over their behavior and enjoy complex challenges (Davis, 1989). Thus, the need for achievement could be mediated by perceived usefulness, perceived ease of use, and attitude in influencing student learning satisfaction. Moreover, this study also aims to compare male and female students. Ramírez-Correa et al. (2015) noted that studies often consider gender as a moderating variable in the TAM, especially in the context of online learning. Such studies generally support the idea that gender affects the intention to use information technology and the direction of online learning readiness. However, empirical evidence from previous studies investigating gender differences has produced conflicting results. For example, several studies, such as Shahzad et al. (2021) at higher education institutions, have found a significant difference between gender and the tendency to accept online learning. On the other hand, findings from several studies did not show a significant relationship between gender and online learning acceptance and satisfaction. Adams et al. (2022) and Formoso (2018) found that male students are more ready for online learning than their female counterparts. Due to these gender differences, an empirical study was conducted to investigate whether there is a significant difference in learning satisfaction between female and male students using online video presentations. It is hoped that through this study, we can better understand the role of gender differences in the use of technology. Therefore, the main objective of this research is to examine the mediating influence of the need for achievement on the role of perceived usefulness, perceived ease of use, and attitude in determining student learning satisfaction.

2.0 PROBLEM STATEMENT

Online learning is an approach that uses digital technology to connect lecturers and students, and it can be applied at all levels of education (Dengel et al., 2023; García-Morales et al., 2021). Online learning became especially necessary during the COVID-19 pandemic, when face-to-face meetings between students and lecturers were replaced by online meetings using video conferencing applications such as Cisco WebEx, Zoom, Skype, MS Teams, and Google Meet. The development of online learning requires two types of resources: digital resources and technology (Tang et al., 2021; Wang et al., 2024). Digital resources include educational videos, video conferences, social media networks, and other digital materials (Tang et al., 2021), while the technological resources consist of computers, laptops, tablets,

smartphones, and televisions (Brown et al., 2022). Even if lecturers or students have both types of resources, access to quality internet connectivity remains a significant challenge in the teaching and learning process (McLean & Attardi, 2023; Rahmatpour et al., 2024). Internet access is also a common issue in online learning (Brown et al., 2022; Tang et al., 2021). However, Malaysia's internet infrastructure is continually improving, and Malaysian telco companies offer a variety of affordable services. Nevertheless, students may still face internal challenges in online learning, such as a lack of self-discipline, motivation, and focus (Mishra et al., 2020).

3.0 OBJECTIVES

Objective 1: To identify gender-related differences in the relationships among perceived usefulness, perceived ease of use, attitude, need for achievement, and learning satisfaction in the context of using online video for undergraduate research project presentations.

Objective 2: To examine the mediating effect of the need for achievement on the relationships among perceived usefulness, perceived ease of use, attitude, need for achievement, and learning satisfaction in the context of using online video for undergraduate research project presentations.

4.0 LITERATURE REVIEW & THEORETICAL FRAMEWORK

4.1 LEARNING SATISFACTION

Customer satisfaction is a crucial issue not only across all industrial sectors but also in educational institutions. Satisfaction arises from an emotional response to an activity (Rahmatpour et al., 2024). For students, satisfaction encompasses the quality of teaching and learning, which is influenced by factors such as the competence of the lecturer, the teaching techniques and methods employed by the lecturer, the social environment, and the quality of services offered. Students act as customers to educational institutions and have specific needs that must be addressed by the institution's management (Trinh et al., 2024). Therefore, the success and excellence of students begin with a comfortable, high-quality teaching and learning environment. A learning environment that meets students' needs is a key factor driving

individual success and satisfaction (Hassan & Mohd Hassan, 2024). According to Trinh et al. (2024), student satisfaction has become a critical concept in higher education, as it is often used as a measure in university rankings. Thus, evaluating student satisfaction is essential and must be carried out by educational institutions to assess customer satisfaction.

Satisfaction is a consideration or decision that reflects the level of use of a product or service feature. It represents a positive learning experience. Empirical studies have found that the success of online learning is closely linked to student satisfaction (Jiang et al., 2021). Satisfaction is a key factor in determining the quality of online education. Furthermore, student satisfaction contributes to academic achievement (Jiang et al., 2021). Four factors affect student satisfaction with online learning: i) communication and interaction between instructors and students; ii) total time on task; iii) engagement and active learning; and iv) collaboration among classmates (Rajabalee & Santally, 2021). Student satisfaction in online learning increases when the learning is well-planned, encourages reflection, and provides a suitable platform for interaction and collaboration (Landrum et al., 2021). Several studies have been conducted to measure student satisfaction with online learning. However, in terms of undergraduate research education, studies are limited to higher education settings. With research evaluation, it has become a challenge for lecturers to implement effective online learning for research education due to the lack of decisions and discussions about the effectiveness of the learning methods.

4.2 TECHNOLOGY ACCEPTANCE MODEL (TAM)

Several models have been developed to analyze and understand the factors that influence the acceptance of technology. The Technology Acceptance Model (TAM) is a framework used to understand how users accept and adopt technology. TAM was developed in 1986 by Fred Davis in his doctoral thesis. Initially, TAM was designed to explain how users accept new information technology, such as management information systems or software. However, with technological advancements, TAM has also been applied in various technological contexts, including mobile technology, social media, and the Internet of Things (IoT) (Yadav & Shanmugam, 2024). Since its introduction in 1986, TAM has continued to evolve and improve. The TAM model explains that a user's perception influences

their attitude toward the benefits of using information technology or online learning (Alfadda & Mahdi, 2021). The model illustrates how perceived usefulness and ease of use impact technology acceptance. This research utilized constructs modified from the TAM model: perceived ease of use, usefulness, and attitude, all of which can predict student learning satisfaction (Alfadda & Mahdi, 2021).

Perceived ease of use refers to the belief that technology can be easily understood and used. Indicators of ease-of-use in information technology include being easy to learn, improving user skills, and being easy to operate (Davis, 1989). On the other hand, perceived usefulness is defined as the belief that technology will benefit those who use it. Technological usefulness includes making tasks more accessible, increasing productivity, enhancing effectiveness, and improving performance. The third variable is attitude (Alfadda & Mahdi, 2021). In TAM, attitude is conceptualized as a person's acceptance or rejection of a system, influenced by their experience with technology in their work (Davis, 1989). Other researchers have noted that attitude is a crucial factor influencing individual behavior. A person's attitude consists of cognitive, affective, and behavioral components.

TAM is a reliable model for assessing various learning technologies. Previous studies have also proven that TAM's core variables; perceived usefulness and perceived ease of use, significantly influence the acceptance of learning technologies. TAM-Extended has been developed by adding new variables such as cognitive absorption, performance expectations, and social influence (e.g., Al-Adwan et al., 2023; Lin & Yu, 2023). With these developments, TAM continues to be refined and optimized for use in various emerging technological contexts. The application of TAM has helped organizations understand how users adopt technology and ensure that the technology is well received (Al-Adwan et al., 2023). This study extends TAM by incorporating the need for achievement as a mediator variable. The study posits that the relationship between perceived usefulness, perceived ease of use, attitude, and learning satisfaction in the context of using online video for undergraduate research project presentations may be mediated by the need for achievement.

4.3 NEED FOR ACHIEVEMENT AS A MEDIATOR

The need for achievement refers to the urge to excel, reach a certain standard, and strive for success. Some individuals have an intrinsic drive that compels them to succeed (Landrum et al., 2021). These individuals pursue personal achievement rather than seeking external rewards. They have a desire to do things better or more efficiently than before. Through analyzing thousands of personal stories, McClelland (1985) discovered that humans are not simply creatures of satisfaction—there is a deeper drive that fuels their actions. He identified three core internal needs: the need for achievement, the need for affiliation, and the need for power. According to McClelland, life experiences shape these dominant needs from birth, with one need taking priority over the others. McClelland (1985) found that high achievers distinguish themselves from others by their desire to improve.

The factors that reflect a person's high need for achievement are: 1) situations where they can be personally accountable for solving a problem, 2) a tendency to set moderate goals and take calculated risks, and 3) a desire for feedback on their performance (McClelland, 1995). Individuals with a high need for achievement take personal responsibility for their performance outcomes because doing things well satisfies their intrinsic needs. Students with a performance orientation tend to be goal-focused, self-confident, willing to take risks, and seek feedback to enhance their performance (McClelland, 1995). In contrast, students who prioritize the need for affiliation and power may focus more on social relationships and influencing others than on their own performance. Educators can use this knowledge to motivate less motivated students by providing clear goals and constructive feedback to help improve their performance.

4.4 DIFFERENCES BETWEEN MALE AND FEMALE STUDENTS

Gender is not only concerned with biological differences between men and women but also includes psychological, social, and cultural differences between the sexes. Additionally, the achievement gap between male and female students is a global phenomenon. Empirical studies have shown that female students tend to achieve higher academic performance than their male counterparts (McClelland, 2005). This academic achievement disparity in favour of female students has raised concerns about gender imbalance (Ramírez-Correa et al., 2015). The issue is also linked to learning satisfaction and support. Yusoff and Azman (2020) found differences in the learning support and involvement between male and female students, which affect academic achievement. Female students receive higher levels of learning support and engagement than male students. Studies have also highlighted gender differences in academic achievement. For instance, Chung et al. (2020) found that learning styles, skills, and strategies tend to favor female students more than male students. Previous research has also suggested that female students tend to be more positive and attentive toward university work than male students (Adams et al., 2022; Shahzad et al., 2021).

However, when it comes to technology in learning, studies have found that male and female students adapt to technology differently across various dimensions. Male students, for example, may adopt certain technologies more quickly than female students, and vice versa (Chung et al., 2020; Loureiro et al., 2020). These studies, however, show some inconsistencies. This research aims to explore the differences in learning satisfaction between male and female students using technology and the underlying reasons for these differences. Therefore, this study examines and compares the mediating influence of the need for achievement on the relationships between perceived usefulness, perceived ease of use, attitude, and learning satisfaction. Based on these observations, the following hypotheses are proposed:

H1a: The need for achievement mediates the relationship between perceived usefulness and learning satisfaction regarding online video usage for undergraduate research presentations of male students.

H1b: The need for achievement mediates the relationship between perceived ease of use and learning satisfaction regarding online video usage for undergraduate research presentations of male students.

H1c: The need for achievement mediates the relationship between attitude and learning satisfaction on online video usage for undergraduate research presentations of male students.

H2a: The need for achievement mediates the relationship between perceived usefulness and learning satisfaction on online video usage for undergraduate research presentations of female students.

H2b: The need for achievement mediates the relationship between perceived ease of use and learning satisfaction regarding online video usage for undergraduate research presentations of female students.

H2c: The need for achievement mediates the relationship between attitude and learning satisfaction on online video usage for undergraduate research presentations of female students.

Figure 1 portrays the conceptual framework of the study.

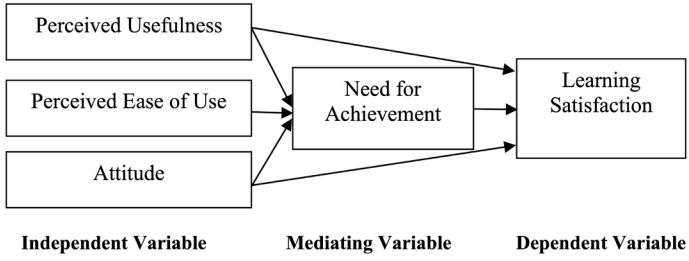

Figure 1. Conceptual Framework

5.0 METHODOLOGY

This study's research design follows a non-experimental, quantitative approach using survey research to explore and describe student satisfaction with online video presentations. The population for this study consisted of final-year students at the Faculty of Administrative Science and Policy Studies, Universiti Teknologi MARA (UiTM) Seremban Campus. The sample size was determined based on Kline's (2005) guidelines for analyzing structural equation models (SEM). Kline (2005) suggests that a sample size of 100 is considered small, 100 to 200 is medium, and a sample over 200 is significant. Therefore, the sample size for this study was 200 respondents, with 100 respondents selected from each gender. A systematic sampling technique was employed.

The research instrument was adapted from the questionnaires used in studies by Al-Fraihat and Sinclair (2020), Ho et al. (2020), and Vodă and Florea (2019). The measurement scale used in the questionnaire was a Likert scale, with five response options: (1) strongly disagree, (2) disagree, (3) uncertain, (4) agree, and (5) strongly agree. The researchers ensured the study was conducted with integrity, following the procedures set by the institution. This research received approval from the Ethical Committee at Universiti Teknologi MARA (UiTM) in October 2021. Table 1 summarizes the items used in the study.

Variables	Items
Perceived Usefulness	U1. Using the online learning system improves my learning performance. U2. Using the online learning system promotes my learning effectiveness. U3. Using the online learning system gives me greater autonomy and flexibility. U4. I find the online learning system valuable and comfortable in my learning
Perceived Ease of Use	E1. Interacting with the online learning system requires little mental effort. E2. The online learning system is easy to use. E3. It is easy to become skillful at using the online learning system.
Attitude	A1. Using the online learning system is a good idea. A2. The online learning system provides an attractive learning environment.
Need for Achievement	N1. I excel in what I do. N2. I will continue until everything is perfect. N3. I am a hardworking person. N4. I do more than what people expect me to do. N5. I plunge into tasks with all my heart.
Learning Satisfaction	L1. I am satisfied with the performance of the online platform. L2. I enjoy using the online platform in my study. L3. The online platform satisfies my educational needs. L4. Overall, I am pleased with the experience of using the online platform.

Table 1. Measurement of the Variables

The final data were input into SPSS software for analysis using structural equation modelling (SEM). The approach used was Confirmatory Factor Analysis (CFA) to analyze the measurement model. Six fit indices were used: Goodness of Fit Index (GFI), Tucker-Lewis Index (TLI), Comparative Fit Index (CFI), and Normed Fit Index (NFI). In this study, the Chi Square/ Degree of Freedom ratio (χ^2/df) was less than 5 (< 5), which is in line with Kline (2005). The Root Mean Square Error of Approximation (RMSEA) value was less than 0.08 (< 0.08), as recommended by Hair et al. (2010). Convergent validity (CV) refers to how closely a test relates to other tests measuring the same or similar constructs. According to Hair et al. (2010),

CV values are obtained based on factor loading, average variance extracted (AVE), and composite reliability (CR). Factor loading and CR values must exceed 0.60 and 0.70, respectively, as suggested by Hair et al. (2010). AVE values should exceed 0.50 (Byrne, 2010). The bootstrapping method was also employed to confirm the mediating effect.

6.0 FINDINGS

6.1 DEMOGRAPHIC PROFILES

A total of 200 questionnaires were collected from respondents of both genders. In terms of Cumulative Grade Point Average (CGPA), 46 students (21.5%) had a CGPA of more than 3.50, followed by 110 students (55%) with a CGPA between 3.00 and 3.50, and 44 students (23.5%) with a CGPA of less than 3.00. The results also showed that 123 students (61.5%) received an A for their research proposal, while 77 students (38.5%) received a B. When evaluating barriers to device and network access, most students reported facing difficulties with online learning (n = 167, 83.5%).

6.2 CONFIRMATORY FACTOR ANALYSIS

The male model fits well (χ 2/df = 3.312, $p < 0.001$, NFI = 0.930, GFI =0.911, TLI = 0.920, CFI =0.916, and RMSEA =0.025). The female model fits are as follows: χ 2/df =3.235, $p < 0.001$, NFI =0.920, GFI = 0.940, TLI =0.930, CFI =0.941, and RMSEA =0.032).

6.3 CONVERGENT AND DISCRIMINANT VALIDITY

Based on Table 2, it is evident that each indicator of the research variables has a factor loading value exceeding 0.60. The data also show that the Average Variance Extracted (AVE) and Composite Reliability (CR) values exceed 0.50 and 0.60, respectively, as recommended by Hair et al. (2010). All indicators are thus considered valid for the research and can be used for further analysis.

Variables	Items	Item Loadings		AVE		CR	
		M	F	M	F	M	F
Perceived Usefulness	U1	0.722	0.678	0.820	0.753	0.860	0.840
	U2	0.711	0.685				
	U3	0.700	0.747				
	U4	0.723	0.786				
Perceived Ease of Use	E1	0.614	0.764	0.830	0.767	0.823	0.826
	E2	0.626	0.766				
	E3	0.610	0.730				
Attitude	A1	0.731	0.801	0.810	0.742	0.842	0.805
	A2	0.772	0.742				
Need for Achievement	N1	0.854	0.814	0.820	0.779	0.802	0.852
	N2	0.849	0.823				
	N3	0.820	0.817				
	N4	0.807	0.767				
	N5	0.742	0.743				
Learning Satisfaction	L1	0.714	0.772	0.840	0.769	0.812	0.842
	L2	0.739	0.746				
	L3	0.690	0.730				
	L4	0.687	0.687				

Note: Average Variance Extracted, AVE; Composite Reliability, CR; Male, M; Female, F

Table 2. Value of Factor Loading, AVE, and CR

The discriminant validity assessment ensures that the constructs have the strongest relationships with their indicators (Hair et al., 2010). As shown in Tables 3 and 4, discriminant validity is achieved because the square root of the Average Variance Extracted (AVE) is greater than the correlations, and the correlation values between the constructs are greater than 0.50 but less than 0.85 (Fornell & Larcker, 1981).

Variables	1	2	3	4	5
Perceived Usefulness	**0.906**				
Perceived Ease of Use	0.634	**0.911**			
Attitude	0.657	0.676	**0.900**		
Need for Achievement	0.571	0.579	0.763	**0.906**	
Learning Satisfaction	0.502	0.608	0.641	0.599	**0.917**

Note: The squared root of AVE is shown in bold on a diagonal

Table 3. Discriminant Validity of Construct (Male Data)

Variables	1	2	3	4	5
Perceived Usefulness	**0.868**				
Perceived Ease of Use	0.614	**0.876**			
Attitude	0.591	0.583	**0.861**		
Need for Achievement	0.678	0.559	0.571	**0.883**	
Learning Satisfaction	0.569	0.632	0.557	0.641	**0.877**

Note: The squared root of AVE is shown in bold on a diagonal

Table 4. Discriminant Validity of Construct (Female Data)

6.4 STRUCTURAL MODEL

As shown in Table 5, for male data, the results confirm that the relationship between perceived usefulness ($\beta = 0.004$, $p < 0.001$), perceived ease of use ($\beta = 0.006$, $p < 0.001$), attitude ($\beta = 0.005$, $p < 0.001$), and learning satisfaction is partially mediated by the need for achievement. Therefore, H1a, H1b, and H1c are supported. In contrast, the female data show that the relationship between perceived usefulness ($\beta = 0.004$, $p < 0.001$), perceived ease of use ($\beta = 0.005$, $p < 0.001$), attitude ($\beta = 0.004$, $p < 0.001$), and learning satisfaction is fully mediated by the need for achievement. Thus, H2a, H2b, and H2c are supported. Additionally, Hayes' mediation method was used to assess the mediating effect. If the Boot LLCI and Boot ULCI ranges do not include the value zero (0), the estimate is considered significant, and a mediation effect is present. The results confirm the mediation effect of the need for achievement on the relationships between perceived usefulness, perceived ease of use, attitude, and learning satisfaction for both genders. These results are presented in Table 5.

Standardized Direct Effects	Std. Estimate M			Std. Estimate F		
PU ⇨ LS	0.048***			0.010		
PEU ⇨ LS	0.054***			0.004		
A ⇨ LS	0.056***			0.002		
NA ⇨ LS	0.089***			0.076***		
PU ⇨ NA	0.042***			0.050***		
PEU ⇨ NA	0.073***			0.063***		
A ⇨ NA	0.052***			0.057***		
Standardized Indirect Effects		**95% Confidence Interval**			**95% Confidence Interval**	
		Lower Limit	**Upper Limit**		**Lower Limit**	**Upper Limit**
PU ⇨ NA ⇨ LS	0.004***	0.002	0.015	0.004***	0.002	0.103
PEU ⇨ NA ⇨ LS	0.006***	0.003	0.018	0.005***	0.003	0.082
A ⇨ NA ⇨ LS	0.005***	0.002	0.122	0.004***	0.002	0.057

*Note: ***Paths are significant at the 1% level ($p < 0.01$). ***Indirect effects are significant at the 1% with bootstrap at 5000 and bias-corrected percentile method. Male, M; Female, F; Perceived Usefulness, PU; Perceived Ease of Use, PEU; Attitude, A; Need for Achievement, NA; Learning Satisfaction, LS.*

Table 5. Results of the Hypothesised Model

7.0 DISCUSSION AND CONCLUSION

Drawing on the Technology Acceptance Model (TAM), the primary purpose of this study was to identify gender-related differences in the relationships among perceived usefulness, perceived ease of use, attitude, and student learning satisfaction. This study also examined the mediating role of the need for achievement. For male students, the need for achievement partly mediates the relationship between perceived usefulness, perceived ease of use, attitude, and student learning satisfaction. This suggests that while perceived usefulness, ease of use, and attitude influence learning satisfaction,

the need for achievement does not necessarily play a decisive role in this relationship. In contrast, for female students, the need for achievement fully mediates the relationship between perceived usefulness, perceived ease of use, attitude, and learning satisfaction. This indicates that achievement is crucial for the perceived usefulness, ease of use, and attitude to influence female students' learning satisfaction.

In other words, female students tend to be more self-motivated, driven to set challenges, and seek continuous feedback on their performance. They prefer tasks with clear goals and measurable results. Therefore, teaching methods adopted by lecturers are essential in determining the effectiveness of teaching and, ultimately, student learning satisfaction. However, many studies report that most lecturers still rely on conventional teaching methods. It is crucial for lecturers to adopt new technologies that create a dynamic learning environment, enhancing students' knowledge and skills. Despite awareness of technological developments, many lecturers are hesitant to incorporate new technologies into teaching (Singh et al., 2024). Hence, lecturers should receive both training and motivation to use technology effectively in the classroom.

From a practical standpoint, educational institutions should provide the necessary hardware and software support to both educators and students, ensuring they meet industry needs (Muhamad Yusof et al., 2024). Transitioning from traditional teaching methods may be challenging but is achievable with proper technological facilities and student motivation to embrace digital learning. Institutions and educators should work to create an awareness of digital learning among students and offer the necessary tools for success. Additionally, educators' ability to identify technological challenges and offer solutions will be vital in fostering understanding (Trinh et al., 2024). Governments and telecommunication sectors must collaborate to improve access to high-speed Internet and provide digital devices to underserved students. Community learning centres with technological resources can bridge the digital divide, and programs such as tablet distribution for underprivileged students can accelerate these efforts. Subsidies for low-income families' Internet access could also serve as a short-term solution. Ongoing training in educational technology for lecturers is equally important, including knowledge on software, online tools, and digital teaching techniques. Technical support for lecturers to address issues

swiftly is essential, and the creation of communities of practice among educators can further encourage the widespread use of technology.

It is essential for educators to understand their students' learning needs to develop strategies and teaching methods tailored to the students' diverse needs. By identifying the limitations in student learning, educators can choose the most appropriate teaching methods and activities to enhance student comprehension (Yadav & Shanmugam, 2024). Additionally, educators should modify their teaching approaches based on students' backgrounds, offering ideas and analogies that resonate with them (Noor & Hadi, 2024). Educators must also continuously improve their knowledge of technology, pedagogy, and content to remain effective and relevant in their roles (Wang et al., 2024). With sufficient competence, educators can better prepare students to excel in the global academic arena (Noor, 2023). Moreover, it is crucial to develop digital learning content that reflects the local context, such as Bahasa Melayu materials aligned with the national syllabus. Collaborations with technology companies can help accelerate this process. Furthermore, educational institutions should provide guidance on digital safety for students, offering workshops to raise awareness about online safety.

Educational technology has revolutionized how instructors access information and deliver content. Through interactive systems, instructors can assess students' understanding in real time, adapt teaching to meet needs, and foster problem-solving skills (Hisham et al., 2025). Technology also improves the learning experience by making it more engaging, flexible, and responsive to student needs. In conclusion, while some may view educational technology as a challenge, it can offer new ways for students to engage with course material effectively and meaningfully.

Platforms like YouTube and social media are not distractions but can be integrated into future lesson plans. Our data suggest three key findings: (i) female students tend to be more goal-oriented than male students; (ii) male students do not necessarily need a strong need for achievement to experience learning satisfaction; and (iii) other factors, beyond individual personality, may play a more significant role in male students' learning satisfaction. The findings of this study validate the TAM theory and contribute to the literature, especially within an Eastern context. This research helps provide

intervention recommendations for enhancing university students' learning satisfaction. By extending the TAM framework within the Malaysian setting, this study fills gaps in previous research and emphasizes the role of need for achievement in fostering online learning satisfaction.

However, this study does have limitations. First, survey methods carry the risk of Common Method Variance (CMV), which can distort relationships between variables (Podsakoff et al., 2003). Harman's test showed that the amount of CMV was insignificant, with the first extraction factor explaining only 30.89% of the total variance. To mitigate CMV in future studies, researchers should apply Harman's single-factor test. Second, the sample size was relatively small, limiting the ability to generalize the findings. Future research should extend this model and methodology to larger and more diverse samples. Third, this study used a cross-sectional design, which only captures data at a single point in time and cannot establish causal relationships. Future research should adopt a longitudinal approach to provide more comprehensive insights into the phenomenon.

8.0 ACKNOWLEDGEMENTS

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9.0 AUTHORS' CONTRIBUTION

Nurul Hidayana, M. N. designed and organized the experiments, while Hasnatulsyakhira, A. H. conducted the experiments and prepared the data. Nurul Hidayana, M. N. led the manuscript writing, with all authors providing valuable feedback and contributing to the research, analysis, and manuscript development.

10.0 CONFLICT OF INTEREST DECLARATION

We certify that this article is the original work of the Authors and Co-Authors. It has not been previously published nor is it under consideration for publication elsewhere. This research/manuscript has not been submitted for publication, nor has it been published in whole or in part elsewhere. We attest that all Authors have made significant contributions to the work, the validity and legitimacy of the data, and its interpretation for submission to IJELHE.

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