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Journal of Computing Research and Innovation 10(2) 2025

Journal of Computing Research and Innovation

Evaluating User Acceptance of the UnityHub Web-based System in Higher Education: A Descriptive Analysis

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ARTICLE INFO

Article history:
Received 25 June 2025
Revised 28 August 2025
Accepted 28 August 2025
Published 1 September 2025

Keywords:
Web-Based System
Communication Platform
User Acceptance
Technology Acceptance Model
Information System

DOI:
10.24191/jcrinn.v10i2.549

ABSTRACT

The transition to hybrid learning in Malaysian higher education created a need for centralized platforms that enhance academic communication and class management. UnityHub was introduced as a web-based system to simplify group registration and strengthen student–lecturer interaction. The purpose of this study was to assess students' acceptance of UnityHub using the Technology Acceptance Model (TAM) and to examine both the overall level of acceptance and the relative strengths and weaknesses of its dimensions. A total of 90 students from Universiti Teknologi MARA, Penang Branch participated in the survey, which used a TAM-based questionnaire comprising 24 items. Data were analyzed using descriptive statistics, including mean scores and standard deviations. The findings show that satisfaction scored highest (mean = 4.16), followed by attitude (3.80) and ease of use (3.78). Perceived usefulness (3.71) and intention to use (3.72) were moderately high, while self-efficacy was lowest (3.42). Overall, UnityHub achieved strong acceptance for usability and efficiency, though improvements in academic integration and user confidence are needed. The study is limited to a single department sample; future research should involve multiple faculties and compare UnityHub with other platforms to enhance generalizability.

1. INTRODUCTION

Effective communication is essential in educational settings, particularly in online and hybrid learning environments where physical interactions are limited. The COVID-19 pandemic accelerated the transition to such learning models in Malaysian higher education, revealing critical challenges in sustaining engagement, managing academic information, and maintaining timely interactions between students and lecturers. In these contexts, the use of digital communication platforms becomes vital for supporting continuous learning and academic coordination.

However, fragmented communication channels and the lack of centralized systems often lead to delays, confusion, and disengagement. Recognizing these issues, UnityHub was developed as a web-based

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https://doi.org/10.24191/jcrinn.v10i2.549

academic management platform that organizes student-lecturer communication and class group registration into a single, accessible interface. Designed to streamline communication and information access, UnityHub enables students to join their respective class groups based on current timetables, receive timely updates from lecturers, and manage academic participation via mobile devices. While the platform addresses key communication and coordination gaps in hybrid learning, its long-term effectiveness depends heavily on user acceptance. Educational technologies regardless of their technical features must be perceived as useful and easy to use by students to ensure sustained adoption. This is particularly important in the post-pandemic context, where digital tools are expected to play a permanent role in academic processes. Therefore, understanding user perceptions is critical.

This study adopts the Technology Acceptance Model (TAM) to evaluate students' acceptance of UnityHub. TAM is a widely recognized theoretical framework used to predict users' acceptance of information systems based on two primary constructs: perceived usefulness (PU) and perceived ease of use (PEU). These variables influence users' attitudes, satisfaction, and intention to continue using a system. By incorporating TAM, this study provides a theoretically grounded analysis of UnityHub's reception among its target users. As digital platforms like UnityHub play a central role in academic communication, it is important to evaluate how students perceive and accept such systems. This study, guided by the Technology Acceptance Model (TAM), uses descriptive analysis to assess students' acceptance of UnityHub. Accordingly, the objectives of this research are as follows:

1. To assess students' acceptance of UnityHub across six key constructs self-efficacy, satisfaction, perceived usefulness, perceived ease of use, intention to use, and attitude toward use using descriptive statistical analysis.
2. To examine the relative strengths and weaknesses of UnityHub's acceptance dimensions in order to highlight areas of high student approval as well as aspects that indicate only moderate acceptance.

The subsequent sections explore relevant literature on the challenges of online communication, explain the development of the UnityHub web-based system, outline the research methodology, and present the analysis, results, and discussion. The final section concludes the research findings.

2. LITERATURE REVIEW

Technology integration in higher education has grown rapidly, particularly in response to the COVID-19 pandemic, which accelerated the adoption of online and hybrid learning platforms. This shift has brought user acceptance into sharper focus, as the success of any educational technology depends on how well users perceive and engage with it. Therefore, understanding the factors that influence users' acceptance and intention to use digital academic platforms is critical in evaluating system effectiveness beyond technical functionality.

The Technology Acceptance Model (TAM), first introduced by Davis (1989), remains one of the most established theoretical frameworks for evaluating information system adoption. TAM posits that two key constructs perc3eived usefulness (PU) and perceived ease of use (PEU) shape users' attitudes toward a system, which subsequently influence their behavioral intention to use it. A system is likely to be adopted when users believe it will improve their performance (PU) and is easy to operate (PEU). These constructions have been widely validated in studies of information systems and online applications across various domains.

In educational contexts, TAM has been applied extensively to examine students' interactions with e-learning platforms, digital portals, and web-based communication tools. For instance, Xie and Lee (2015) reported that both PU and PEU significantly influenced students' acceptance of social learning technologies.

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Hollister et al. (2022) observed that during pandemic-driven online learning, students evaluated system adoption largely through the lens of functionality and ease of navigation. Similarly, Bashir (2018) highlighted that user interface clarity and intuitive design are crucial for fostering positive learning experiences in multimedia courseware.

Beyond the original TAM constructs, researchers have incorporated additional variables to reflect the complex nature of user behavior. Among these, self-efficacy, the belief in one's ability to use a system effectively—has emerged as a consistent predictor of technology adoption (Meng & Zhang, 2023). Students who feel confident in their ability to navigate digital platforms without assistance are more likely to perceive the system as useful and user-friendly. Likewise, attitude toward use and intention to use are often included in extended TAM models to capture motivational and behavioral dimensions more comprehensively (Venkatesh et al., 2012). These expanded frameworks offer a more holistic understanding of how users form judgments about a system, particularly in educational environments.

Recent regional studies have confirmed the relevance of these constructs in the Malaysian higher education landscape. Al Husaini and Shukor (2023) identified time-efficiency, self-efficacy, and information access as key drivers of acceptance in student-facing systems. Abbas et al. (2019) found that social media platforms used for academic collaboration are adopted when they are perceived as both practical and engaging. These studies underscore the importance of designing systems that align with users' preferences, behaviors, and contextual needs.

In measuring acceptance, many studies rely on quantitative descriptive analysis of TAM-based surveys. Researchers typically use Likert-scale instruments to capture users' responses on PU, PEU, satisfaction, intention, and related constructs. Descriptive statistics such as means, standard deviations, and response frequencies are then used to interpret acceptance levels and highlight system strengths or weaknesses (Lee & Kozar, 2012; Rawashdeh et al., 2021). This approach provides both depth and breadth, offering a data-driven understanding of user reception and system usability.

Despite the extensive literature on TAM and technology acceptance, limited research has examined the adoption of communication-specific platforms like UnityHub, particularly within the Malaysian post-pandemic educational context. Moreover, few studies have integrated descriptive analysis with TAM constructs to evaluate systems developed for academic communication and group coordination. This study addresses that gap by applying TAM to investigate students' perceptions, satisfaction, and intention to use UnityHub, offering practical insights for improving digital communication infrastructure in higher education.

3. THE DEVELOPMENT OF UNITYHUB: A WEB-BASED SYSTEM FOR EFFECTIVE DISTANCE LEARNING MANAGEMENT

This section discusses the development of UnityHub, a web-based system designed to streamline the management of students in distance learning. Through this platform, lecturers can ensure students stay up to date with their coursework, minimizing the risk of them falling behind in online classes. UnityHub provides students with essential information from the start of the semester, simplifying the process by offering a list of registered subjects along with corresponding class groups based on the latest semester schedule. The user-friendly interface allows students to select their subjects and groups easily, enabling them to join designated groups with just a few clicks. Additionally, UnityHub is accessible via mobile devices, ensuring convenient access for all users.

The development of UnityHub involves three key stakeholders: academic management (including lecturers), students, and system developers. Fig. 1 illustrates the collaborative relationship among these parties. The process begins with the academic management team providing a timetable, which is then

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distributed to lecturers and students. Based on this timetable, lecturers register their respective groups on platforms such as WhatsApp or Telegram to obtain the necessary platform link.

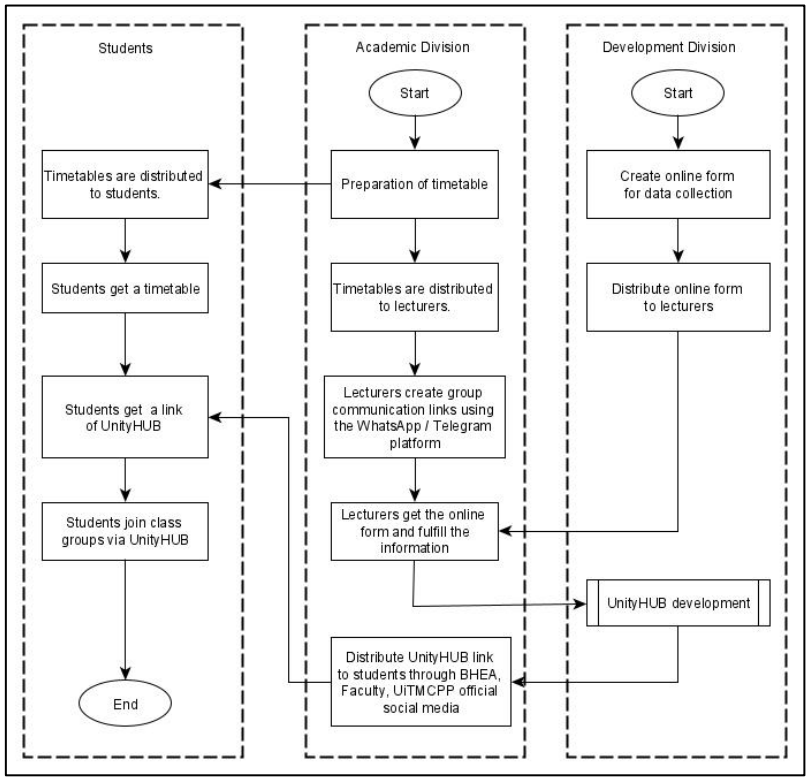

Fig. 1. Flowchart of class group registration using UnityHub

Simultaneously, the system development team creates an online form (Fig. 2) to collect essential data from lecturers for the UnityHub platform. This data includes information such as subject area, subject code, subject name, class group, lecturer's name, communication platform, and group link. Once the lecturers submit this information, the UnityHub development can proceed. When development is complete, the platform link is distributed to students through faculties and official social media channels, allowing students to join their respective groups based on the timetable simply by clicking the link.

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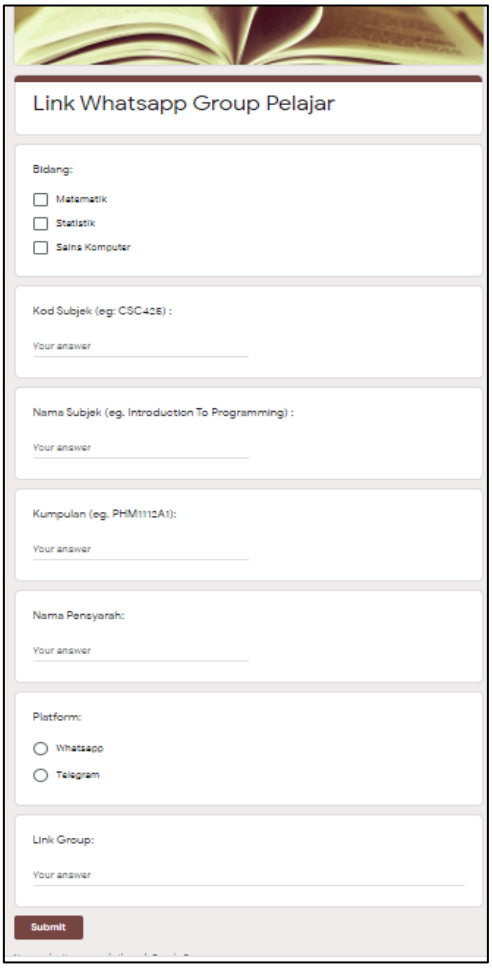

Fig. 2. Online form

UnityHub offers an efficient method for gathering geographically dispersed students, eliminating the need for lecturers to invite each student individually. Before the first class, lecturers often need to assemble their students promptly, and UnityHub streamlines this process, ensuring all students are organized into their respective groups within a week, which enables seamless classroom management.

Fig. 3 provides an overview of the UnityHub interface, which includes six tabs: HOME, SARJANA, SARJANA MUDA, DIPLOMA, PRA-DIPLOMA, and KENALI JSKM. The HOME section serves as a platform for the JSKM coordinator to communicate essential messages to users. Another tab displays a comprehensive list of subjects offered under JSKM, while the KENALI JSKM tab links users to the official JSKM website. For instance, Pre-diploma students (tag no.1) can click on the PRA-DIPLOMA tab to access a list of pre-diploma subjects. They can then select their subjects (tag no.2), and the platform will display associated class groups. By clicking the provided link, students can join their designated class group effortlessly. Both lecturers and students receive timely notifications via the registered platform (tag no.3), promoting effective communication and engagement.

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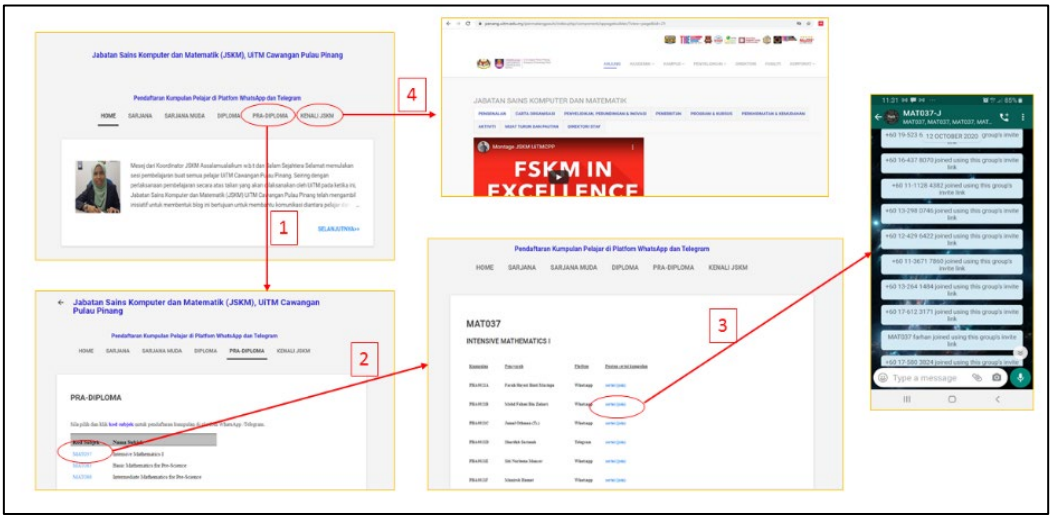

Fig. 3. UnityHub Interface

UnityHub is an innovative web-based system designed to enhance distance learning management. By simplifying the process of organizing students into class groups, UnityHub helps students stay on track with their coursework. Its user-friendly interface and mobile accessibility provide convenience for both lecturers and students. UnityHub effectively unites academic management, lecturers, and students, creating an efficient and streamlined distance learning experience. With its comprehensive features and seamless integration, UnityHub has the potential to revolutionize distance learning program management.

4. METHODOLOGY

4.1 Participants

The population of this study comprised undergraduate students from Universiti Teknologi MARA (UiTM), Penang Branch. A total of 90 students were selected using cluster sampling, with the sample drawn from five classes under lecturers in the Computer and Mathematics Department. These classes were selected based on their active engagement with the UnityHub system during the academic semester, thereby representing users with direct system exposure. While this sampling approach ensured data relevance, it introduces a potential bias, as the sample may not fully represent students from other faculties or campuses. This limitation is acknowledged and discussed further in the final section.

4.2 Instrument

Data was collected using a structured online questionnaire adapted from established instruments based on the Technology Acceptance Model (TAM) as proposed by Davis (1989) and later extended by Venkatesh et al. (2012). The questionnaire consisted of 24 items measuring six TAM-related constructs: self-efficacy, perceived usefulness (PU), perceived ease of use (PEU), satisfaction, intention to use, and attitude toward use. Items were rated on a five-point Likert scale ranging from 1 (“strongly disagree”) to 5 (“strongly agree”). An additional section captured demographic information, including gender, age, academic level, field of study, sources of UnityHub information, and reasons for using the system. To ensure content validity, the instrument underwent expert review by two senior lecturers with research expertise in educational technology and instrument design. Their feedback informed minor adjustments in item wording to ensure contextual relevance. A pilot test involving 15 students from a different faculty was

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conducted to assess clarity and consistency of the items prior to full-scale distribution. Based on feedback, minor modifications were made to improve item phrasing without altering construct meanings.

4.3 Procedure

The data collection process was conducted through an online survey administered via a secure digital platform. An invitation to participate in the study was disseminated through official faculty communication channels, including email and WhatsApp group announcements coordinated by class lecturers. The message included a brief explanation of the study's purpose, a statement assuring confidentiality and voluntary participation, and a link to the online questionnaire. All selected participants were students enrolled in courses that actively utilized UnityHub during the semester. Prior to completing the survey, students were informed that their responses would be used solely for research purposes and would remain anonymous, with no identifying information being collected. Upon accessing the link, participants were directed to a brief introduction page outlining the scope of the study, followed by the main questionnaire. Each respondent was given an estimated time of 10 to 15 minutes to complete the survey at their own convenience.

4.4 Data Analysis

Data was analyzed using IBM SPSS Statistics Version 26. Descriptive statistics were used to address both research questions. For categorical data such as demographics and reasons for using UnityHub, frequencies and percentages were calculated. For Likert-scale items measuring TAM constructs, mean scores and standard deviations were computed to assess levels of user satisfaction, perceived usefulness, perceived ease of use, and behavioral intention. These descriptive metrics provided insight into the distribution of responses and the general acceptance level of UnityHub among students.

Instrument reliability was evaluated using Cronbach's Alpha for each construct. Following guidelines by Hinton et al. (2004), alpha values above 0.70 were interpreted as indicating high reliability, while scores above 0.90 signified excellent internal consistency. All constructs met or exceeded the 0.80 threshold, confirming the instrument's reliability for use in this study. To facilitate interpretation of the mean scores, student responses were categorized into five levels ranging from Very Low to Very High, as shown in Table 1. This classification provided a clearer understanding of whether each construct reflected low, moderate, or high levels of acceptance of UnityHub.

Table 1. Mean score interpretation

Mean Score	Interpretation
4.30 – 5.00	Very High
3.50 – 4.29	High
2.70 – 3.49	Moderate
1.90 – 2.69	Low
1.00 – 1.89	Very Low

The cut-off ranges in Table 1 follow the approach suggested by Zaki and Ahmad (2017), ensuring consistency with prior studies in interpreting students' responses. Based on this interpretation scale, the following section presents the descriptive results of the study. The findings are organized according to the TAM constructs, with each mean score reported together with its corresponding interpretation level to provide a clearer picture of students' acceptance of UnityHub.

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5. RESULTS AND DISCUSSION

5.1 Descriptive analysis

The survey included 90 students, with 60% identifying as female and 40% as male, as illustrated in Fig. 4. Table 2 presents the demographic characteristics of the respondents. Most respondents (90%) were young adults aged between 18 and 22 years. In terms of academic qualifications, the majority were diploma students (63.3%), followed by degree students (35.6%), and only one respondent was a master's student. Most respondents were from fields related to Science and Technology (84.4%), while 15.6% were from Social Science.

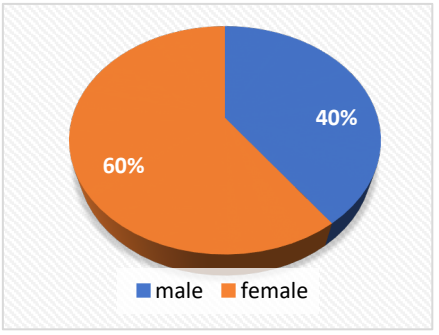

Fig. 4. Respondent gender

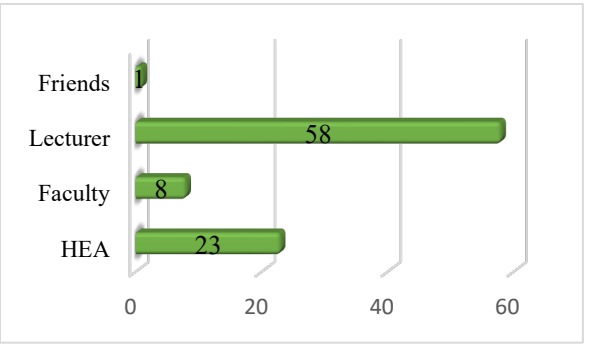

Fig. 5. Sources of information

Table 2. Demographic characteristics of respondents

	Sample	Frequency	Percentage (%)
Gender	Male	36	40
	Female	54	60
Age	18-22	81	90
	23-27	8	8.9
	>27	1	1.1
Educational	Diploma	57	63.3
Level	Bachelor	32	35.6
	Master	1	1.1
Field	Science & Technology	76	84.4
	Science Social	14	15.6

Fig. 5 displays the various sources from which students received information about UnityHub. The data reveals that 58 students learned about UnityHub from their lecturers. Additionally, 23 students received information from the Academic Affairs Division, 8 from faculty, and only 1 student from friends.

As shown in Fig. 6, regarding the purpose of using UnityHub, 46% of students agreed that UnityHub saves time, while 28% found it easy to use. Additionally, 17% of students reported using it at the request of their faculty, and 9% used it out of personal interest. Since UnityHub is easily accessible on mobile devices, students can register for groups anytime, anywhere, and on any platform. Users do not require formal training to use the application, as its simple design allows them to join class groups without navigating multiple web pages.

A similar study by Lee and Kozar (2012) found that perceived ease of use, usefulness, and trust in an application significantly influence user satisfaction. UnityHub users provided positive feedback, recommending that the application be applied or replicated across other faculties. Students responded

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favourably to the website's design, navigation, and functionality, which encouraged them to use the application.

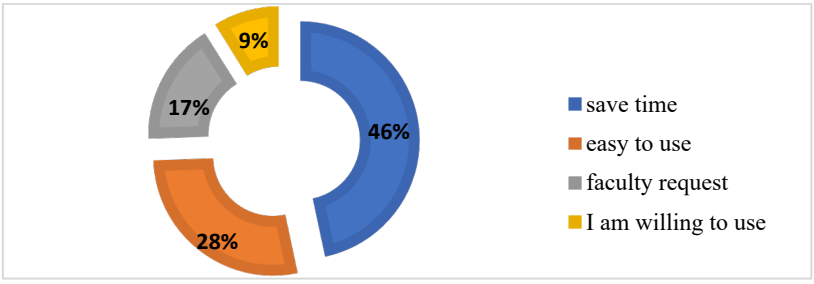

Fig. 6. Purpose in using UnityHub

5.2 Reliability test

Cronbach's Alpha was calculated to assess the reliability of the survey constructs. As shown in Table 3, each Cronbach's Alpha score exceeds 0.80. According to Hinton et al. (2004), Cronbach's Alpha values above 0.50 indicate moderate reliability, while values of 0.70 and above indicate high reliability for dependent and independent variables. The Cronbach's Alpha scores confirm that all measurement items across variables are consistent.

Table 3. Summary of Cronbach's Alpha

Variable	Items	Cronbach's Alpha
Satisfaction	4	0.868
Self-efficacy	4	0.912
Perceived usefulness	5	0.914
Perceived ease of use	4	0.924
Intention to use	3	0.901
Attitude towards use	4	0.872

Table 4. Mean and standard deviation of item

Item	Mean	Standard Deviation
Self-Efficacy		
I am confident of using UnityHub even if there is no one around to show me how to do it.	3.43	0.794
I am confident of using UnityHub even if I have never used such a system before.	3.51	0.811
I am confident of using UnityHub even if I don't have a user manual for reference.	3.38	0.800
I am confident of using UnityHub without assistance from anyone.	3.34	0.837
Satisfaction		
The UnityHub is effective for gathering students' group information.	4.16	0.579
The UnityHub is efficient for time saving.	4.16	0.669
The UnityHub is efficient for cost saving.	4.09	0.647
The UnityHub is efficient for reducing human error.	4.02	0.734
Perceived Usefulness		
Joining class groups is a faster way with UnityHub.	3.82	0.743
UnityHub would enhance my effectiveness in studying.	3.61	0.730
UnityHub would improve the class group joining process.	3.71	0.738
UnityHub facilitates student joining class group.	3.74	0.728
I find UnityHub useful for my studies.	3.67	0.703
Perceived Ease of Use		
The features in UnityHub are clear and understandable.	3.74	0.663
The UnityHub is flexible to access anywhere.	3.80	0.782
The use of UnityHub is very easy to be skilled.	3.77	0.765

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I find that UnityHub is easy to use.	3.80	0.767
Intention to Use		
I intend to use UnityHub to enhance communication among lecturers and students	3.77	0.720
I intend to use UnityHub at the beginning of the semester.	3.70	0.741
I intend to use UnityHub every semester.	3.68	0.668
Attitude Toward Use		
Using UnityHub at the beginning of the semester is good.	3.84	0.669
I like the idea of using UnityHub.	3.78	0.700
I have a positive attitude towards using UnityHub.	3.79	0.727
I find the use of UnityHub is a good idea for my study process.	3.79	0.727

Table 4 presents the mean and standard deviation of each item for each construct. All items scored above 3.00, ranging from 3.34 to 4.16, indicating that students generally had moderate to high levels of acceptance of UnityHub. The results encompass various aspects related to UnityHub acceptance, including self-efficacy, satisfaction, perceived usefulness, perceived ease of use, intention to use, and attitude toward the platform.

In terms of self-efficacy, the results indicate that students have a moderate level of confidence in their ability to use UnityHub effectively. On average, they reported being able to navigate the platform without external guidance (mean = 3.43), even without prior experience with similar systems (mean = 3.51) or a user manual (mean = 3.38). Confidence in using the system independently, without assistance from others, was slightly lower (mean = 3.34). These results suggest that while students are reasonably self-reliant, their confidence remains moderate. This aligns with Meng, Qian and Zhang, Qi (2023), who highlighted that self-efficacy is often situational and may require additional training support, and with Mohd Basar, Zulaikha et al. (2021), who observed that learners adapt to new systems even when prior exposure is limited.

Regarding satisfaction, the findings reveal consistently high ratings across all items. Students rated UnityHub as effective for gathering group information (mean = 4.16), efficient for saving time (mean = 4.16), cost-efficient (mean = 4.09), and capable of reducing human error (mean = 4.02). Compared to self-efficacy, which was moderate, satisfaction scores were notably higher, indicating that students perceive strong benefits once they begin using the system. This is consistent with Alyami et al. (2021), who emphasized time management as a critical factor in student performance, and Alhusaini (2023), who also reported that efficiency-driven platforms improve academic experience.

Perceptions of usefulness yielded moderately positive results. Students considered UnityHub helpful in speeding up the process of joining class groups (mean = 3.82) and improving their effectiveness in studying (mean = 3.61). They also rated it as beneficial for enhancing the group-joining process (mean = 3.71), facilitating participation (mean = 3.74), and useful overall (mean = 3.67). Although these scores are positive, they are lower than those for satisfaction, suggesting that while students appreciate UnityHub's role in streamlining processes, they may not yet see it as directly transformative for academic performance. These findings are in line with Hollister et al. (2022), who observed that digital platforms enhance engagement but may vary in perceived academic impact, and Nurkaliza (2018), who noted that usefulness perceptions are shaped by system integration with learning activities.

The construct of ease of use was also rated positively, with mean scores for clarity of features (3.74), accessibility (3.80), and ease of learning (3.77), resulting in an overall mean of 3.80. These results show that students find UnityHub straightforward and convenient to use, a factor that directly supports adoption. This resonates with Bashir (2018), who highlighted the importance of user-friendly design for sustained engagement. Compared with usefulness, ease of use scored slightly higher, suggesting that accessibility and simplicity are stronger drivers of student acceptance.

Students' intention to use UnityHub showed moderate to high results, with mean scores of 3.77 for using it to enhance communication, 3.70 for using it at the start of the semester, and 3.68 for continued use every semester. These scores suggest that students are open to adopting UnityHub as part of their academic

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routines, though their intention is slightly lower than their reported satisfaction. This finding reflects Abbas et al. (2019) and Mazana et al. (2019), who both noted that students' adoption of new systems is shaped by both functional efficiency and perceived long-term value.

Finally, students' attitudes toward using UnityHub were favourable. They rated positively the idea of using it at the beginning of the semester (mean = 3.84) and expressed strong liking for the platform (mean = 4.02). Their positive attitude overall (mean = 3.79) and perception that UnityHub is a good idea for supporting their study process (mean = 3.79) reinforce a generally welcoming disposition toward the system. This is consistent with Rawashdeh et al. (2021), who highlighted students' positive attitudes toward e-learning platforms, and Abbas et al. (2019), who found that favourable attitudes strongly influence behavioural intention.

Across constructs, satisfaction recorded the highest mean score (4.16), indicating that efficiency benefits are the strongest driver of student approval. Ease of use and attitude also scored high (around 3.8), reflecting positive experiences with accessibility and favourable overall perceptions. Perceived usefulness and intention to use were moderate (3.7), showing that while students value the system, they may not yet see it as fully essential for academic tasks. Self-efficacy scored lowest (3.42), suggesting that although students can use UnityHub independently, additional support or training could further strengthen confidence. Collectively, these results demonstrate that while UnityHub is well received, future improvements could focus on enhancing its perceived academic usefulness and supporting user self-efficacy.

6. CONCLUSION

This study assessed students' acceptance of UnityHub at Universiti Teknologi MARA (UiTM) across six constructs of the Technology Acceptance Model (TAM). The findings show that satisfaction was rated highest (mean = 4.16), highlighting strong approval of the platform's efficiency in saving time, reducing costs, and minimizing errors. Ease of use (mean = 3.78) and attitude (mean = 3.80) were also high, indicating positive perceptions of accessibility and overall design. By contrast, perceived usefulness (mean = 3.71) and intention to use (mean = 3.72) were moderate, suggesting that while students value UnityHub's role in group management, its academic impact could be strengthened. Self-efficacy was lowest (mean = 3.42), showing that some students may need additional support or training.

These results meet the study objectives by providing a comprehensive overview of acceptance and identifying relative strengths and weaknesses. Practical implications include improving academic features to enhance perceived usefulness and offering onboarding tools to build self-efficacy. Limitations include the single-department sample, which reduces generalizability. Future studies should test UnityHub across multiple faculties and campuses and compare its acceptance with other platforms.

Overall, UnityHub has achieved a generally positive level of acceptance among students, particularly in satisfaction and ease of use, but opportunities remain to strengthen its perceived usefulness and user self-efficacy. Addressing these areas will be crucial to ensuring its sustainable role as an academic communication and management tool in hybrid learning environments.

7. ACKNOLWEDGEMENT/FUNDINGS

The authors wish to express their gratitude to Universiti Teknologi Mara (UiTM), Cawangan Negeri Pulau Pinang, Kampus Permatang Pauh, Malaysia, for their generous support in providing the data and facilities for this research.

https://doi.org/10.24191/jcrinn.v10i2.549

8. CONFLICT OF INTEREST STATEMENT

The authors declare that this research was conducted without any personal, commercial, or financial conflicts of interest and affirm there are no conflicts with the funders.

9. AUTHORS' CONTRIBUTION

Norazah Omar: Data Analysis, Results and Discussion and Editting, **Nurhafizah Ahmad**: Methodology, Results and Discussion and Editting,. **Jamal Othman**: Literature Review, Conclusion and Abstracts, **Rozita Kadar**: Introduction and System Development.

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