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EXPLORING EDUCATION IN THE DIGITAL AGE: INNOVATIONS, INTERSECTIONS AND INSIGHTS

PREFACE

Dear esteemed readers and contributors,

It is with great pleasure and excitement that I extend a warm welcome to you all to this special edition of our journal, dedicated to exploring the diverse and dynamic themes shaping the landscape of education in the digital era. As we embark on this journey of discovery, each theme serves as a guiding beacon, illuminating the innovative intersections of technology and pedagogy.

Our first theme, Teaching based on Artificial Intelligence (AI), Machine Learning (ML), and the Internet of Things (IoT), sets the stage for our exploration by delving into the transformative potential of intelligent technologies in education. From personalized learning experiences to predictive analytics, AI, ML, and IoT hold the promise of revolutionizing traditional teaching methods and unlocking new pathways to knowledge acquisition.

Theme 2 invites us to immerse ourselves in the realm of 360 Learning, Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR). Here, we witness the fusion of physical and digital worlds, as learners embark on immersive journeys that transcend the confines of the traditional classroom. Through experiential learning and interactive simulations, VR, AR, and MR technologies redefine the boundaries of education, offering unprecedented opportunities for engagement and exploration.

In Theme 3, we explore the power of Collaborative Teaching, Global Learning, and innovative practices such as Gamification, Maker-Space, and Maker Lab initiatives. This theme underscores the importance of collaboration, cultural exchange, and hands-on experimentation in fostering creativity, critical thinking, and problem-solving skills among learners worldwide.

Theme 4 sheds light on the paradigm shift towards Open and Distance Learning (ODL), Self-Instructional Materials (SIM), and the utilization of Big Data Analytics in Learning. Here, we witness the democratization of education, as learners gain access to high-quality resources and personalized learning experiences irrespective of geographical constraints. Big Data analytics further enhance the educational landscape by providing insights into learner behavior and preferences, enabling educators to tailor instruction to individual needs.

In Theme 5, we explore the evolving role of Social Media Learning as a catalyst for knowledge dissemination, collaboration, and community building. From online forums to multimedia platforms, social media offers a dynamic space for peer-to-peer learning, digital literacy development, and the cultivation of virtual learning communities.

Theme 6 invites us to embrace Design Thinking for new Learning Delivery, emphasizing the importance of user- centered design principles in creating innovative and inclusive learning experiences. Through empathetic design, educators can reimagine learning environments that foster creativity, adaptability, and lifelong learning skills.

In Theme 7, we delve into Andragogy in technology-based learning, Instructional Design, and Best Practices in e-learning. This theme highlights the importance of learner-centered approaches, effective instructional design strategies, and the dissemination of evidence-based practices to optimize learning outcomes in the digital age.

Finally, Theme 8 explores the Development of e-learning systems, materials, and mobile technologies, including the emergence of MOOC-based mobile learning materials. Here, we witness the evolution of educational technologies, as mobile devices and online platforms redefine the boundaries of access and engagement in education.

As we navigate through these diverse themes, let us embrace the spirit of inquiry, collaboration, and innovation that defines our scholarly community. I extend my deepest gratitude to all the contributors who have enriched this journal with their insights and expertise. May this edition inspire new ideas, spark fruitful discussions, and contribute to the ongoing dialogue surrounding the future of education.

Thank you for your dedication and commitment to advancing the frontiers of knowledge in the field of education.

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Theme 1: Teaching based on Artificial Intelligence (Ai)/ Machine Learning (ML)/ Internet of Things (iOT)

1. Factors influencing the Internet of Things (IoT) implementation in fieldwork courses
2. Exploring the Potential of Artificial Intelligence in Chemical Engineering Education

Theme 2: 360 Learning/Virtual Learning Virtual Reality/Augmented Reality & Mixed Reality

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2. Post pandemic conceptual study on virtual learning method (VLM) in chemical engineering related courses

Theme 3: Collaborative Teaching or/and Global Learning/A.D.A.B in Teaching and Learning/ Gamification in Teaching and Learning/Maker-Space/ Maker Lab

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2. Group Conflict: Exploring Forming and Storming in Group Work
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4. Digital Game-Based Value Learning Model for Management Students in Malaysian Higher Education Institutions
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6. Exploring Optometry Students' Perspectives on Satisfaction within the Clinical Learning Environment
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Theme 4: Open and Distance Learning (ODL)/Self Instructional Materials (SIM)/Big Data Analytics in Learning

1. Adaptive Learning in the Age of COVID-19: Exploring Psychomotor and Cognitive Impacts on Open and Distance Learning (ODL)
2. Programme Outcomes Attainment towards Psychomotor Skill Development during Open Distance Learning in Engineering Laboratory Courses

Theme 5: Social Media Learning

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1. Leading the Way: Self-Directed Learning and Leadership in University Student-Leaders

Theme 7: Andragogy in technology-based learning/Technology in learning/Instructional design in learning/Best practices in e-learning

1. Challenges and Innovations: Adapting Practical Culinary and Foodservice Subjects for Distance Learning during COVID-19
2. Exploring Tertiary Education ESL Learners' Dependency on the Internet, Internet Sources, and Internet Source Reliability

Theme 8: Development of e-learning system/Development of e-learning materials/Development of mobile systems in Learning/Development of MOOC-based mobile learning materials

1. Student Acceptance with the Usage of Padlet in Guiding Research Statistics Analysis
2. MOOC Courses Development: Guidelines for GLAM MOOC

Guest Editors

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Student Acceptance of the Usage of Padlet in Guiding Research Statistics Analysis

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ABSTRACT
Padlet is a free e-learning application best described as an online whiteboard. Using this application in teaching and learning is one alternative to improve students' achievement and performance. This study aims to identify the factors that influence the impact of student acceptance of Padlet application in the learning research statistics analysis for the completion of their final year project. This study relied on the Unified Theory of Acceptance and Use of Technology (UTAUT). Based on UTAUT, the study has identified five main determinants that could influence student acceptance: the instructor's effectiveness, the student's competency with technology, the design and content of courses, accessibility of essential resources, and infrastructure dependability. This study used a cross-sectional survey, and data were collected from 185 students from the Faculty of Administrative Science and Policy Studies, UiTM. Overall, the research findings show the instructor's effectiveness, student's competency with technology, design and content of courses, accessibility of essential resources, and infrastructure dependability significantly influence the acceptance of the Padlet application. The instructor's effectiveness is the most significant predictor. This study implies that educators are advisable to employ teaching methods

that are more fun, productive, and effective compared to traditional methods.

Keywords: E-learning; Padlet; research statistics; student acceptance; UTAUT

INTRODUCTION

Technology in teaching and learning can improve instructors' abilities in solving various teaching problems. E-learning aims to positively impact students, especially in processes and motivation in learning and teaching (Adedoyin & Soykan, 2023; Vlachogianni & Tselios, 2022). According to Code et al. (2020), technology and the Internet can enable students to communicate without time and geographical limitations. Among the applications that can be used are Padlet, Powtoon, Kahoot, Prezi, SlideShare, YouTube, and WordPress. Padlet is an application that allows users to collaborate in text, photos, links, or other content (Nadeem, 2021), besides its convenience and attractiveness (Johnson et al., 2023). It can be accessed via the laptop/PC and smartphones. Padlet is an application that allows users to post their opinions using electronic sticky notes (e-stickers) on a digital wall that can be shared (Chen, 2022).

Padlet can also record personal notes, essential to-do lists, and feedback. It uses the concept of click and drag, just like a virtual bulletin board. Using Padlet can significantly impact learning outcomes (Mahmud, 2019). It makes the learning process very interesting and interactive, allowing students to be actively involved in group activities, giving equal opportunities to all students in giving ideas or comments and permitting each student to write or upload learning materials such as video, text, image, audio, or web link on the digital wall at the same time (Frison & Tino, 2019). Padlet makes the learning process more precise and attractive because the media can proffer information through sound, pictures, movement, and color, both naturally and through manipulation. It promotes an active, two-way communication, whereby without media, the teaching-learning process occurs one way (Mahmud, 2019). With the help of the media, instructors do not have to explain the teaching material repeatedly because students can repeat and replay it whenever needed. Moreover, it encourages students to seek and love knowledge (Nadeem, 2021). Azid et al. (2020) have studied the influence of the Padlet application on mathematics learning outcomes. They demonstrated that the influence of using Padlet in an e-learning learning model on mathematics learning outcomes was higher than the face-to-face learning model. Johnson et al. (2023) also studied the impact of using Padlet as an online learning medium during the COVID-19 pandemic. They revealed that Padlet can increase student activity and involvement in learning activities.

However, the Padlet application is still relatively new in Malaysia (Sukumaran et al., 2021) and is often used for writing. Some students who live in rural areas need help getting good internet access. Many students feel burdened by the cost of internet data to enable them to attend online classes and exams and send assignments (Ntshwarang et al., 2021). They need a fast and uninterrupted internet to follow online learning. In addition, some students lack facilities like computers or mobile phones (Basar et al., 2021). Moreover, the unconducive learning environment is also challenging for online learning students (Almaiah & Alyoussef, 2019; Razali et al., 2022).

Lecturers/instructors must possess the appropriate information and communications technology (ICT) skills for online learning. One of the skills in managing ICT is having knowledge of radio, television, mobile phones, the internet, software, and computers. Educators should provide quality services and possess diverse skills in teaching. However, empirical studies discovered that many educators retain traditional teaching approaches (Mercader & Gairín, 2020). Hence, educators need to grasp new skills in using information technology (IT) applications during teaching and learning (Ismail & Hassan, 2019), as they play a critical role in imparting knowledge and skills to students. Therefore, a lecturer's competency in knowledge, technical skills, and attitude is critical because it will impact the quality of teaching (Chung et al., 2020). In that regard, it is reasonable for all parties, such as the ministry, educational institutions, and teaching staff, to collaborate in identifying teaching and learning quality enablers. The current study aims to determine the factors that influence the impact of student acceptance of the Padlet application in the learning research statistics analysis for the completion of their final year project. This study hopes to provide recommendations to the faculty to foster the usage of Padlet among lecturers and students. The following research questions were specifically designed for that purpose:

1. How do the effectiveness of the instructor, student's competency in technology, effectiveness of design and content of courses, accessibility of essential resources, and infrastructure dependability predict user acceptance of the usage of Padlet for undergraduate research subjects?
2. What is the most significant factor predicting user acceptance of the usage of Padlet for undergraduate research subjects?

LITERATURE REVIEW

E-Learning using Padlet

In 2019, the world was shocked by the arrival of a new virus from Wuhan, China. COVID-19, caused by the Coronavirus, was declared a global pandemic on March 11, 2020. Malaysia is no exception to the impact of COVID-19. The education field, one of the many afflicted systems, is badly jeopardized, forcing schools and higher institutions to change their delivery method to be completely online. The Ministry of Education (MOE) of Malaysia has instructed universities to take advantage of Open and Distance Learning (ODL; Albelbisi & Yusop, 2020). Online learning allows people to acquire lifelong learning skills (Maatuk et al., 2022). This skill requires someone who can determine what to learn, have self-learning skills, and become independent (Osei et al., 2022).

Technology can improve work results and produce high-quality students (Adedoyin & Soykan, 2023). Padlet is a usable Web 2.0 application to collaborate and communicate for learning. This application can facilitate communication between students and lecturers (Chung et al., 2020). It is an online application that maintains interaction and communication for collaborative learning. The Padlet application is an alternative to improving student achievement and performance (Frison & Tino, 2019). Padlet, formerly known as Wallwisher, is an interactive whiteboard application in Web 2.0. The interactive board, also known as a virtual wall, serves as a space that allows students and lecturers to share information, such as text, images, videos, and audio, in one interface. Members will be able to see the information written on the wall, proving its effectiveness in

collaborative learning (Nadeem, 2021). In short, Padlet is a straightforward technology that can be applied to attract students' attention in various ways, whether in or out of class. However, more research needs to be done on the effectiveness of the Padlet application, especially involving the research subject.

Applied Research Project (ADS555) is a compulsory subject for final year bachelor's degree students at the Faculty of Administrative Science and Policy Studies, Universiti Teknologi MARA (UiTM). Conventional methods used in class for teaching and learning make students feel that the subject is dull and lack interest in learning due to the flat and unattractive delivery methods. Thus, the method of using videos and Padlet becomes an alternative to solve the problems encountered during the teaching and learning process of the ADS555 course. Padlet focuses on mobile learning (M-Learning). Using the application makes it easier for students to learn at a flexible time and place. Teaching contents in the Padlet were supported by YouTube videos created by the instructors. It is a viral medium among the younger generation. Learning through YouTube can help students understand information more easily. For instance, the instructors have created statistical analysis videos, such as Pearson correlation, multiple regression, and ANOVA and t-test analyses. The Padlet platform has won the Gold Award in the International Teaching and Learning Invention Innovation Competition 2023 (iTaLiiC 2023). Figure 1 shows the interface of the ADS555 Padlet.

Figure 1. Padlet Interface (ADS555)

Factors Influencing Padlet Usage Acceptance

A Padlet is a neutral device operating on various mobile phones, computers, and other instruments. It can be accessed via the installed application or the web, which is easier to use. It can be used in teaching and learning activities as a collaborative facilitator by educators who act as the admin who controls the learning activities (Frison & Tino, 2019). There are several enablers of user acceptance in Padlet. Researchers have widely discussed the acceptance of technology in the learning process by combining various models and theories in the research conducted. Commonly used theories for e-learning evaluation are the Technology Acceptance Model (TAM), Unified

Theory of Acceptance and Use of Technology (UTAUT), an extension of TAM, Innovation Diffusion Theory (IDT), Theory of Reasoned Action (TRA), and Theory of Planned Behavior (TPB). These theories and models have different thoughts, beliefs, and benefits.

In this study, five factors were adapted from previous studies related to the acceptance of e-learning. The UTAUT model was formulated by Venkatesh et al. (2003). UTAUT focuses on four direct determinants: (i) performance expectations, (ii) expected effort, (iii) social influence, and (iv) facility conditions. In addition, the construct of behavioral intention will be identified as influencing technology usage. UTAUT also emphasized the critical role of intermediary variables, i.e., (i) age, (ii) gender, (iii) experience, and (iv) voluntary behavioral intention and technology usage. UTAUT's original framework is shown in Figure 2. For the proposed research model, five constructs are directly based on four dimensions of the UTAUT model. The five defined constructs are instructor effectiveness, student competency with technology, design and content of courses, accessibility of essential resources, and infrastructure dependability. The adaptation model is shown in Figure 3.

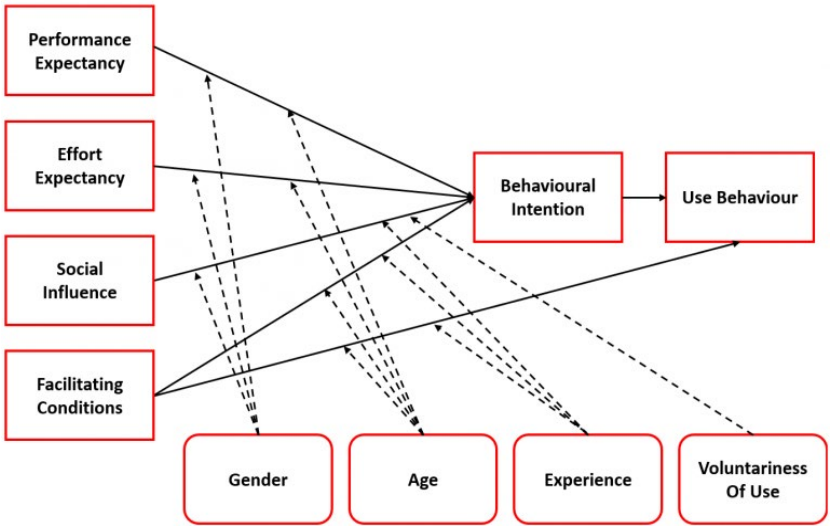

Figure 2. UTAUT Original Framework
Source: Venkatesh et al. (2003)

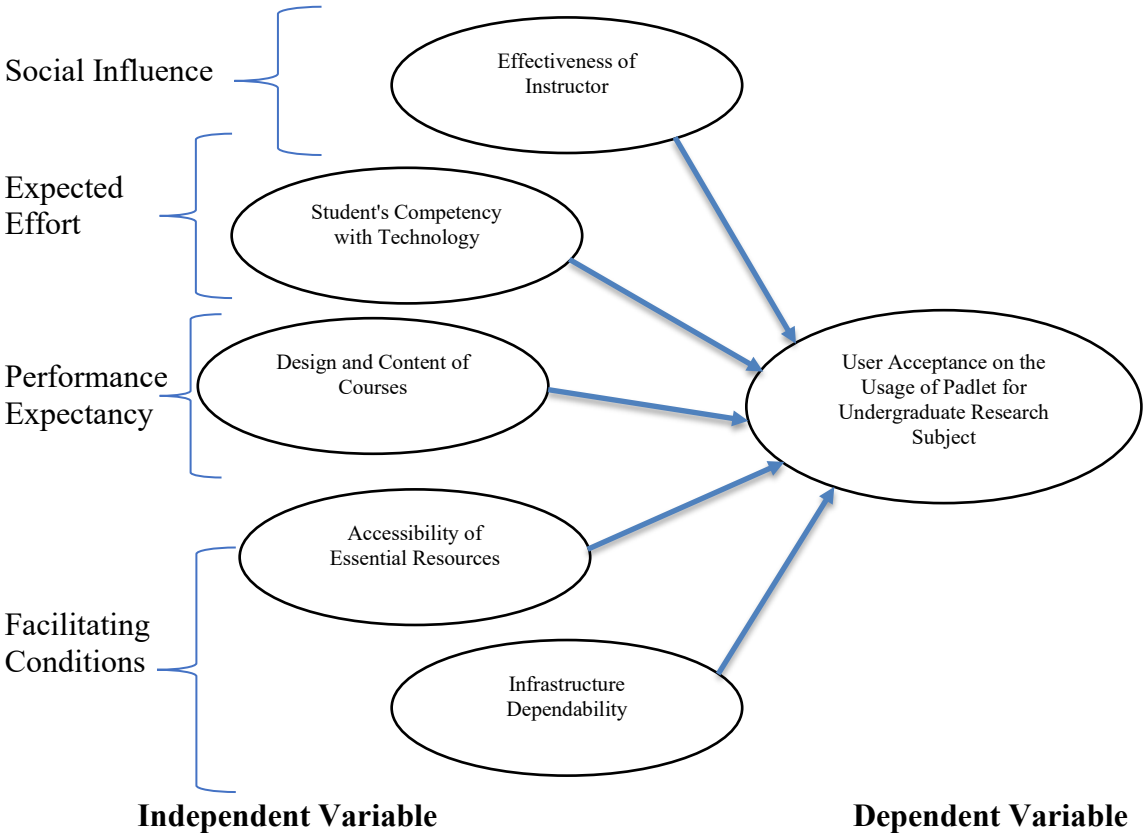

Figure 3. Theoretical Framework of the Study

Performance expectancy is the extent to which the individual believes that using the system will help him or her achieve work performance (Abbad, 2021). Innovation in education forces all parties to be involved directly or indirectly in using e-learning at various levels. The design and content of courses are some of the factors that influence students' acceptance of e-learning. According to Razali et al. (2022), the delivery of information regarding products or services determines the level of consumer acceptance. Likewise, Vlachogianni and Tselios (2022) agreed that e-learning requires effective information delivery by educators to students. Learning materials must be interactive and easily understood (Twum et al., 2022) as educators deliver lectures and supply course materials, lecture notes, tests, and discussions online through e-learning. These activities are seen as virtual learning platforms showing interaction between two parties to create or share existing knowledge. In addition, Mercader and Gairín (2020) also stated that information quality factors using the system usually affect users' high or low level of acceptance.

Expected effort is the level of convenience associated with the use of an application or system. According to Osei et al. (2022), students need to be more comfortable with ICT, and the inefficiency of students in e-learning will indirectly impact their willingness and self-confidence to use it. According to Maphalala and Adigun (2021), higher education institutions with high technology can attract more students, which is closely related to student acceptance of e-learning. E-learning allows students to access information without borders (Abbad, 2021). Students are more exposed to unlimited knowledge through acquired technological skills. Mastery of learning

content can be increased by referring to various online resources, such as additional materials that help to improve students' understanding (Twum et al., 2022).

Social influence is the extent to which an individual thinks that others believe he or she should use the new application or system. The lecturer's role could influence e-learning acceptance. The interaction between students and lecturers allows students to connect with lecturers and their friends when facing problems in an assignment or explaining a concept (Almaiah & Alyoussef, 2019). Guidance and encouragement from lecturers motivate students to use the e-learning system and indirectly be able to accept the system. In addition, a systematic teaching style and friendly interaction are among the factors that encourage students to accept and continue using the learning system (Choudhury & Pattnaik, 2020). Therefore, the lecturers need to be prepared to improve their skills in the use of technology. Lecturers need to be sensitive to IT, such as the construction of teaching videos following the development of global education that requires skills in making videos realistically and interestingly (Ismail & Hassan, 2019). Lecturers must also be trained and exposed to educational technology to change their negative perceptions of existing educational technology. The attitude and awareness of lecturers is the best way to predict their commitment to using educational technology, where a positive attitude towards ICT will help improve their skills in ICT.

Facilitating conditions are the extent to which individuals believe that the organization and technical infrastructure exist to support the use of the system. The findings of this study are supported by Almaiah and Alyoussef (2019), who explained that students who use the e-learning approach can practice the self-directed learning process. Most students agree that the flexibility of the e-learning system and online resources can facilitate and help them learn (Barteit et al., 2020). A flexible system with sufficient content and quality information will meet the needs and give satisfaction to students. Therefore, technical support plays a vital role in the adoption of e-learning. Technical support can reduce students' external problems, such as slow internet access, low signal, and login problems (Maatuk et al., 2022). Provide support to ensure users feel satisfied, which will positively impact the use of technology (Mitrofanova et al., 2021). Based on the discussion above, five hypothesis statements were developed from the five factors obtained through the review:

H1: The instructor's effectiveness predicts user acceptance of the usage of Padlet for undergraduate research subjects.

H2: Student's competency with technology predicts user acceptance of the usage of Padlet for undergraduate research subjects.

H3: Effectiveness of design and content of courses predicts user acceptance of the usage of Padlet for undergraduate research subjects.

H4: Accessibility of essential resources predicts user acceptance of the usage of Padlet for undergraduate research subjects.

H5: Infrastructure dependability predicts user acceptance of the usage of Padlet for undergraduate research subjects.

METHODOLOGY

The method used in this study is a descriptive survey using a questionnaire as the research instrument. Systematic random sampling was used to systematically select the students who registered for the Applied Research Project in 2023. Based on the table of Krejcie and Morgan (1970), the minimum value for the population of 400 people is 196, i.e., the total of randomly selected respondents for this study. The set of questionnaires contains three sections, i.e., Part A: Student Background; Part B: Independent Variables (effectiveness of instructor, student's competency with technology, effectiveness of design and content of courses, accessibility of essential resources, and infrastructure dependability); and Part C (user acceptance on the usage of Padlet for undergraduate research subject). The questionnaire was adapted and modified from Duggal's (2022) study. The measurement items for all variables are as follows:

Effectiveness of Instructor

1. Enthusiasm of instructor.
2. The instructor's style of presentation holds the interest of students.
3. Instructor actively interacts.
4. Students are invited to ask questions and receive answers.
5. Students are invited to participate in class discussion.
6. The instructor encourages the use of e-learning.

Student's Competency with Technology

1. Enjoyment in the use of computer/tablet/phone.
2. Regular use of computer/tablet/phone.
3. Ease in use of computer/tablet/phone.
4. Prior experience in the use of computer/tablet/phone.
5. Not intimidated using technology for education.

Effectiveness of Design and Content of Courses

1. Learning material is sufficient and relevant.
2. The E-learning platform is easy to use.
3. The E-learning platform is easy to navigate.
4. Course material is current and up to date.
5. The user interface is well-designed.

Accessibility of Essential Resources

1. Easy access to the Internet.
2. No bandwidth problems when browsing.
3. Satisfactory browsing speed.
4. Ease of interaction with fellow students.
5. Ease of contacting the instructor.
6. Easy-to-use e-learning website.

Infrastructure Dependability

1. Computer/tablet/phone works fine and supports most required applications.
2. No access issues with email ID, browser, and others.
3. Stable and secure Internet connection.
4. Efficient IT infrastructure.

User Acceptance
1. E-learning is successful.
2. E-learning is an effective method of learning.
3. Likeness towards the idea of using e-learning.
4. Online education is considered a constructive and helpful learning experience.
5. Awareness of e-learning platforms.
6. Improved perception towards e-learning.
7. Intention to continue e-learning.

The questionnaire uses a five-point Likert scale measurement. A pilot study was conducted randomly on 30 final-year students. The data for this study were analyzed using IBM SPSS software version 29.0. A statistical technique was used for analysis depending on the research hypothesis specified. Data were analyzed using descriptive and inferential statistics to obtain research results in percentage, mean, standard deviation, Pearson correlation, and multiple regression. The result of the normality signifies the normal distribution of the data. Therefore, the normality test was conducted by looking at the skewness and kurtosis values. At the univariate level of normality, the normal value of skewness and kurtosis should be in the range of +2 to –2 and +7 to –7, respectively (Kline, 2005). The criteria of Cronbach's alpha for establishing the internal consistency reliability are excellent ($\alpha > 0.90$), good ($0.70 < \alpha < 0.90$), acceptable ($0.60 < \alpha < 0.70$), poor ($0.50 < \alpha < 0.60$), and unacceptable ($\alpha < 0.50$; Hair et al., 2010).

FINDINGS

Demographics of Respondents

This study involved a total of 196 randomly selected respondents. However, only 185 questionnaires were filled. Table 1 shows the demographic background of the respondents. The finding found that most of the respondents were female students (73% (n=135) compared to male students, which was 27% (n=50). Most of the respondents were in the age group of 21 years and above (n=117, 63.2%), and the rest were <21 years old (n=68, 36.8%). In terms of living area, most of them live in urban areas (n=123, 66.5%), followed by semi-urban areas (n=50, 27%) and rural areas (n=12, 6.5%). Next, the respondents were asked about their experience using Padlet. Most respondents have one to 3 years of experience using Padlet (n=126, 68.1%).

Table 1. Demographic Profile

No.	Profile	Frequency (n)	Percentage (%)
1	Gender		
	Male	50	27
	Female	135	73
2	Age Group		

	<21 years old 21 years and above	68 117	36.8 63.2
3	Living Area Rural Semi-Urban Urban	 12 50 123	 6.5 27 66.5
4	Padlet Experience Less than one years 1 – 3 years More than five years	 36 126 23	 19.5 68.1 12.4

The measurement of the mean score level is based on three levels: the mean score range of 1.00 to 2.33 is at a low level, the mean score range of 2.34 to 3.66 is at a moderate level, and the mean score value of 3.67 to 5.00 is at a high level. Based on Table 2, the mean value for the effectiveness of the instructor (4.13), student's competency with technology (4.12), the effectiveness of design and content of courses (4.16), accessibility of essential resources (3.83), infrastructure dependability (4.07), and user acceptance (4.56) were at a high level which indicated positive perception among the respondents on the study variables. This study data has a normal distribution because the skewness and kurtosis values are in the estimated range, and the reliability of all variables is also above 0.60, which means that the instruments used are valid.

Table 2. Normality & Reliability Results

Variables	Mean	SD	Skewness	Kurtosis	Cronbach's Alpha	No. of Items
Effectiveness of Instructor	4.13	0.32	0.064	- 0.919	0.802	6
Student's Competency with Technology	4.12	0.35	- 0.174	- 0. 480	0.823	5
Effectiveness of Design and Content of Courses	4.16	0.46	- 0.344	- 0. 411	0.777	5
Accessibility of Essential Resources	3.83	0.67	- 0.428	0. 236	0.791	6
Infrastructure Dependability	4.07	0.75	0.025	0.967	0.799	4
User Acceptance	4.56	0.70	0.311	0.867	0.813	7

Table 3 shows the relationship between independent variables and dependent variables. The Pearson correlation analysis shows a strong association between effectiveness of instructor ($r = 0.786$, $p < 0.05$), student's competency with technology ($r = 0.530$, $p < 0.05$), effectiveness of design and content of courses ($r = 0.513$, $p < 0.05$), accessibility of essential resources ($r = 0.516$, $p < 0.05$), infrastructure dependability ($r = 0.542$, $p < 0.05$), and user acceptance. Based on the results of correlation analyses, all hypotheses were accepted.

Table 3. Correlation Result

		User Acceptance
Effectiveness of Instructor	Pearson Correlation Sig. (1-tailed) N	0.786** 0.000 185
Student's Competency with Technology	Pearson Correlation Sig. (1-tailed) N	0.530** 0.000 185
Effectiveness of Design and Content of Courses	Pearson Correlation Sig. (1-tailed) N	0.513** 0.000 185
Accessibility of Essential Resources	Pearson Correlation Sig. (1-tailed) N	0.516** 0.000 185
Infrastructure Dependability	Pearson Correlation Sig. (1-tailed) N	0.542** 0.000 185

Based on the results in Table 4, the R square value of 0.550 (55.0%) obtained shows that the effectiveness of the instructor, student's competency with technology, the effectiveness of design and content of courses, accessibility of essential resources, and infrastructure dependability were strongly predicting the user acceptance. The remaining 45% is explained by other variables not included in the research model. The most influential factor is the instructor's effectiveness, with a significant regression coefficient of 0.556. This shows that if the instructor's effectiveness experiences an increase of one unit, it will increase the user acceptance by 0.556 units. The result of tolerance and VIF values also concluded that there is no symptom of multicollinearity between independent variables in the regression model. Multicollinearity indicates a strong relationship between the independent variables in the model regression. Detection of the presence or absence of multicollinearity is done by looking at the tolerance and the VIF value. The regression model is free from multicollinearity when the tolerance value > 0.10 and the VIF value < 10.

Table 4. Regression Results

Variables	Beta (β)	Sig. (p)	Tolerance	VIF
Effectiveness of Instructor	0.556	0.000	0.612	1.655
Student's Competency with Technology	0.325	0.001	0.531	1.535
Effectiveness of Design and Content of Courses	0.386	0.001	0.546	1.312
Accessibility of Essential Resources	0.546	0.000	0.511	1.370
Infrastructure Dependability	0.378	0.016	0.771	1.478

R^2	0.550			
Adjusted R^2	0.534			
F Change	14.722			
Sig.	0.000			

DISCUSSION

The study results showed high student acceptance of the Padlet application for research courses. Teaching and learning became more exciting and interactive using Padlet, allowing students to engage collaboratively. Padlet provides equal opportunities between group users and allows students to review lessons after learning. A digital wall is also available that allows students to write any ideas about their learning through text, pictures, videos, audio, or web links.

The research findings showed the instructor's effectiveness, student's competency with technology, design and content of courses, accessibility of essential resources, and infrastructure dependability on the acceptance of the Padlet application. The instructor's effectiveness is the most significant predictor. It indicates that the educators' enthusiasm greatly influences students' acceptance of e-learning (Ismail & Hassan, 2019). The lecturers need to establish a positive attitude towards the use of technology. A positive attitude is essential to motivate a person to learn something.

Indirectly, the results of this study have implications for the institution's management, lecturers, and students. On the e-learning platform, the instructor should act as a facilitator, not an instructor, and students are expected to be active users in seeking knowledge (Maatuk et al., 2022). The MOE needs to monitor educators in teaching and learning. This is to encourage educators to use a variety of teaching aids and improve their performance in implementing exciting and effective teaching and learning. Complete training and facilities are necessary to improve knowledge and teaching quality (Ismail & Hassan, 2019). Given these results, universities should encourage students to use e-learning systems to enhance their academic performance (Almaiah & Alyoussef, 2019; Razali et al., 2022). The developers of e-learning systems should design effortless applications to motivate students to use the system (Mitrofanova et al., 2021). University management should ensure that all the required resources are available for students, designers, and faculty members when needed (Barteit et al., 2020).

CONCLUSION

The unified theory of acceptance and use of technology (UTAUT) was utilized in this research to analyze students' acceptance of the usage of Padlet for the undergraduate research subject. The primary objective of this research was to investigate the student's acceptance of the usage of Padlet for undergraduate research subjects. The results suggest that instructors' effectiveness, students' competency with technology, design and content of courses, accessibility of essential resources, and infrastructure dependability influence the acceptance of the Padlet application. The results also indicate that the instructor's effectiveness has the most significant effect on user acceptance. In the context of higher education, this research affirms the utility of the UTAUT in predicting the actual usage of e-learning systems by students in developing countries. In conclusion, this study found that using padlet.com instigates undergraduate research learning for all students. This shows that

technology implementation can attract students' interest in mastering the research subject. Nevertheless, some limitations in this research should be addressed. First, the study focused only on students from one university in Malaysia (UiTM); different results may be obtained when examining universities in the same country or other developing countries. Second, potential moderators (age, gender, experience, and voluntary) that could strengthen the prediction of students' behavior were not considered. Finally, in this study, a self-reported measure provided by respondents was used to measure actual use, which might not be the best measure, and the results may be influenced by common method bias (CMV). A more accurate measure is to explore users' acceptance in a longitudinal and mixed-method study.

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Conflict of Interest

We certify that the article is the Authors' and Co-Authors' original work. The article has yet to receive prior publication and is not under consideration for publication elsewhere.

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Authors' Contributions

Nurul Hidayana, M. N. conceived and planned the experiments. Nurul Hidayana, M. N. carried out the experiments and data preparation. Hasnatulsyakhira, A. H. planned and carried out the simulations. Nurul Hidayana, M. H. took the lead in writing the manuscript. All authors provided critical feedback and helped shape the research, analysis, and manuscript.

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