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Implementation of Blended Learning System in Higher Education to Explore the Interaction of Technology, Organization, Environment, and Technology Acceptance Model

Nur Aeni Hidayah[1,*], Qurrotul Aini[2], Putri Ghania[3]

[1,2,3]*Department of Information Systems, Faculty of Science and Technology, UIN Syarif Hidayatullah Jakarta, Banten 15412, Indonesia*

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Abstract

A thorough examination of the deployment of blended learning after the COVID-19 pandemic is necessary to ensure its efficacy in enhancing the educational quality in higher education. The objective of this study is to identify the key elements that strongly impact the adoption of a blended learning system. It will be achieved by applying both the technology-organization-environment framework and the technology acceptance model. The study formulated eight hypotheses and administered online surveys on social media platforms to gather data from a total of 249 participants, including students and lecturers from four Islamic state universities. Participants selected and able to complete the online survey were those who had prior experience with blended learning. Data were analyzed using the PLS methodology. The findings indicated that 92% of participants concurred that blended learning enhanced the quality of education. In addition, seven assumptions have been accepted, with the relationship between the technology context and the perceived ease of use in the blended learning system being the most relevant component. On the other hand, the PLS prediction results demonstrate that the suggested model possesses moderate predictive capability, as evidenced by its lower RMSE and MAE values in comparison to the linear regression model. Subsequent investigations should focus on analyzing the four blended learning models while taking into account factors such as teacher competence, educational systems, and social impacts. This research contributes to the literature on blended learning. This study highlights the need for ongoing research into blended learning models, suggesting future studies explore the long-term sustainability and evolving impacts of blended learning on educational outcomes.

Keywords: Blended Learning System, Technology Acceptance Model, Technology Organization Environment

1. Introduction

Since the COVID-19 epidemic broke out, a large number of colleges and universities have adopted hitherto unheard-of online learning strategies [1], [2]. According to research [3] and [4] reveal that the application of technology is significant in modifying educational approaches. argue that the implementation of technology is crucial for modifying educational approaches. The statistics from July 2020 reveal that over 90% of students globally were impacted by the epidemic, facing substantial challenges in their educational journey [5]. A survey conducted by the Directorate General of Higher Education in Indonesia found that 98% of universities implemented online lecture activities during the 2020/2021 academic year [6].

While online learning provides advantages such as flexibility in scheduling, location, and cost-effectiveness [7], there are drawbacks as well. According to a poll, 19% of students felt that they had trouble understanding the Indonesian lecture material while they learned online [8]. Technical difficulties, such sluggish internet connectivity, become important components of a successful online learning environment [9]. Direct communication and contact, together with extensive hands-on practice, are some benefits of offline learning. This learning is constrained, though, and reliant on tangible infrastructure [10].

Based on the advantages and disadvantages of both approaches, blended learning becomes an alternative to improving the quality of education at universities. Blended learning, according to [11], is an approach that combines the benefits of online and offline learning to provide the greatest benefit to students. A student-centered strategy that promotes

***Corresponding author: Nur Aeni Hidayah (nur.aeni@uinjkt.ac.id)**
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participation in the educational process is blended learning. Also, blended learning allows individuals to be flexible, comfortable, able to interact socially face-to-face, practical learning, unlimited place and time, adapted to student needs, as well as self-discipline.

A thorough examination of the implementation of blended learning is necessary to ensure its efficacy in enhancing the quality of learning. Therefore, important to carry out research on the acceptance and implementation of blended learning in higher education. A study conducted by [12] found that students who engage in blended learning have enhanced self-confidence in their abilities and strengths. Nevertheless, the execution of blended learning cannot be accomplished easily without taking into account the preparedness of the institution. An assessment of the technological infrastructure, which includes evaluating the quality of internet connectivity and the sufficiency of hardware, is a crucial initial stage [13]. Furthermore, it is imperative to take into account the provision of training and assistance for educators in the utilization of novel instructional approaches.

This research employs two widely recognized methodologies to investigate the integration of blended learning in Islamic educational institutions: the technology acceptance model (TAM) and the technology-organization-environment (TOE) framework. The TOE framework is a frequently utilized method for analyzing technology adoption within organizations. The acceptance of an information system is crucial for its utilization [14]. This approach evaluates three main elements: the existence of technology, the existence of structures inside organizations that support it, and the outside environment that affects technology adoption. The TOE has been utilized in this study in order to obtain a thorough grasp of the factors that influence blended learning acceptability in Islamic state colleges. When examining the adoption of technology, researchers often employ the TAM in addition to the TOE framework. The TAM was created by [15] with the aim of elucidating the various aspects that impact an individual's acceptance of information technology. Applying the TAM in the context of blended learning in colleges and universities, this framework could potentially use to gauge how valuable and user-friendly the learning platform appears both teachers and student [15]. Elements such as an intuitive interface, robust technical assistance, and comprehensive training materials might impact the sense of usability. Concurrently, features that facilitate the learning process, such as interactive discussion forums or online quizzes, have the potential to impact views of usefulness.

This research takes a more comprehensive approach to understanding the adoption of blended learning in higher education by integrating TOE and TAM. Institutions must consider organizational, technological, and environmental factors while implementing blended learning. These factors are all assessed using TOE framework. TAM, meantime, offers information about how both lecturers and students perceive the technology used in blended learning. By combining these two models, universities are able to gain a greater awareness of the barriers and drivers that surround blended learning adoption and create more effective plans for its execution. Therefore, the aim of this research is to determine the factors that influence the adoption and assimilation of blended learning and improve the quality of education in Islamic state universities.

2. Method

2.1. Methodology

This study employs a quantitative methodology. Data is gathered using pre-established research tools and then subjected to statistical or quantitative analysis, primarily to verify pre-existing theories. The model used in this research was derived from the work of [16], who used the TOE and TAM models to assess the factors influencing the acceptance of BL in state Islamic universities based on prior literature studies.

Data collection was carried out through an exhaustive review of literature, entailing the examination of relevant scientific books and journals. Additionally, firsthand observations of the implementation of blended learning at state religious universities revealed diverse application methods. It was noted that some courses followed a blended learning format with 60% of the coursework conducted online and 40% offline. This hybrid approach allowed flexibility in learning processes, catering to both in-person and remote learners. Observations also highlighted instances where classes were conducted synchronously, with some students physically present in the classroom while others participated online from various locations. This dual engagement mode provided insights into how different teaching strategies and student engagement techniques were applied to accommodate the needs of all students within the blended learning.

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Subsequently, a survey was administered using a questionnaire. The participants in this survey consisted of students and lecturers. The questionnaire was delivered online using social media platforms like WhatsApp, Line, and Instagram, as well as Google Forms. The data collection period was from October 25 to November 15, 2023. Furthermore, the collected data underwent assessment via statistical techniques to scrutinize outer and inner models, and to test hypotheses. The utilization of Partial Least Squares Structural Equation Modeling (PLS-SEM) was statistically analyzed through the SmartPLS 4 software.

2.2. Sample and Population

The participants in this research consisted of students and professors from four PTKINs, specifically UIN Syarif Hidayatullah Jakarta, UIN Sunan Gunung Djati Bandung, UIN Sunan Kalijaga Yogyakarta, and UIN Maulana Malik Ibrahim Malang. Shifting from general rules to a more precise justification based on statistical power analysis and the requirements of PLS-SEM, thus strengthening the validity of our findings. According to the guidelines of [17], the sample size for PLS-SEM should be at least ten times the number of paths directed at the most complex construct in the model. In this study, the most complex construct involves 8 paths, necessitating a minimum sample size of 80 to satisfy the criterion of having a sufficient number of observations per parameter estimated to ensure stable and reliable results. However, to enhance the statistical power of the study and to ensure the representativeness of the sample across the diverse academic environments of the selected universities, we aimed for a larger sample. A sample size of 249 was determined not only to exceed this minimum threshold but also to allow for a more robust test of the hypothesized model. This size is within the recommended range of 30 to 500 for PLS-SEM studies and is justified by the need to detect smaller effect sizes, which are common in social science research [18]. However, it is important to note that the use of this sample or data in this study may not be generalizable beyond the institutions of PTKIN, as cultural and contextual factors specific to these institutions may influence the results.

2.3. Model and Hypothesis

This research offers a framework combining the TAM and the TOE framework, two popular and widely applied theoretical frameworks. Figure 1 shows that utilize the TAM-TOE model to investigate the factors that impact lecturers and students who adopt and use blended learning strategies. The TOE framework, developed by Tornatzky and Fleischer in 1990, is a commonly used approach for studying technology adoption in organizations. It assesses aspects of available technology, supportive organizational structure, and the influence of the external environment. This research also employs the TAM, developed by Davis in 1986, to understand how professors and students perceive blended learning platforms as useful and easy to use. By integrating TOE and TAM, this study provides a holistic view of the factors influencing the adoption of blended learning in higher education institutions, with TOE evaluating technological, organizational, and environmental factors, while TAM explores individual users' perceptions of usefulness and ease of use. Figure 1 shows that utilize the TAM-TOE model to investigate the factors that impact lecturers and students who adopt and use blended learning strategies.

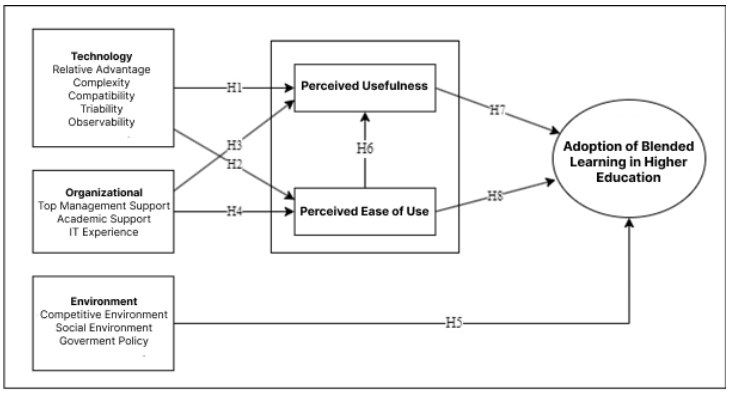

Figure 1. Research Model [19]

Technological infrastructure, software capabilities, and system stability are crucial considerations in the deployment of BL learning systems in the technological setting. The technological background has an impact on how users perceive the advantages and usability of the BL system. This context encompasses the ways in which technology aids

 ISSN 2723-6471

educational requirements and the effectiveness of technology in providing learning content. Technological characteristics that impact adoption include relative benefit, compatibility, complexity, potential of experimentation, and observability [20].

These factors contribute to influencing user perceptions of the benefits and ease of use of the blended learning system, as well as supporting how the technology can meet educational needs and be efficient in delivering learning material. With these considerations, the research hypothesis is as follows:

H1: Does the technology context have a positive influence on the perceived usefulness of the blended learning system?

H2: Does the technology context have a positive influence on the perceived ease of use of the blended learning system?

Academic support, IT expertise, and senior management endorsement are some of the elements that affect an organization's adoption of blended learning systems. The cooperation of top management is crucial in providing the necessary resources and policies to facilitate the implementation of Blended Learning. Academic support encompasses aid provided by peers and educational organizations in the adoption and utilization of innovative educational technologies. The degree that prior technical experience affects the capacity to adopt and integrate new learning systems are referred to as IT experience. In light of these variables, the following hypothesis is advanced in the context of this study:

H3: Does organizational context have a positive influence on the perceived usefulness of the blended learning system?

H4: Does organizational context have a positive influence on the perceived ease of use of the blended learning system?

A blended learning system's implementation in the environment requires a thorough assessment of factors like social dynamics, government restrictions, and the competitive landscape. The competitive landscape demonstrates how competition in the education industry can impact the choice to implement Blended Learning as a strategy to uphold or enhance a competitive position. The social environment encompasses social conventions and social forces that can impact the acceptance and utilization of learning technology. The role of government policy is significant, particularly in terms of regulating and providing support for educational innovations like blended learning. Considering these variables, the following hypothesis is postulated within the framework of this study:

H5: Does the environmental context have a positive influence on the adoption of the blended learning system?

When deciding how to install a BL learning system, perceived usefulness is vital. The extent to which individuals believe that employing a blended learning system will improve their performance in an educational setting is known as perceived usefulness. It encompasses enhancements in learning efficacy, proficiency in assimilating information, and overall enhancement in learning results. This aspect is deemed crucial as it has the potential to impact an individual's choice to adopt and sustain the use of novel educational technologies. In this investigation, the following is the hypothesis:

H7: Does perceived usefulness have a positive influence on the adoption of the blended learning system?

The perceived simplicity of use plays a crucial role in the implementation of a blended learning system. It pertains to the degree to which users, including both students and lecturers, perceive the utilization of the Blended Learning educational system as effortless and devoid of substantial exertion. The significance of this aspect is in its ability to impact users' perception of how well the technology fulfills their educational requirements, hence influencing their inclination to use it. In this investigation, the following is the hypothesis:

H6: Does perceived ease of use have a positive influence on the perceived usefulness of the blended learning system?

H8: Does perceived ease of use have a positive influence on the adoption of the blended learning system?

2.4. Research Indicators

The research makes use of 64 indicators in all. These variables and their associated items have undergone a pilot study phase to validate the research instruments, ensuring their reliability and appropriateness for the main study. The technology context variable included the following five indicators, specifically relative advantage (4 items), complexity (4 items), compatibility (3 items), trialability (3 items), and observability (3 items). The organizational context consists

of six items related to senior management support, three items related to academic support, and three things related to IT experience. The environmental context variable comprises three components: the competitive environment (consisting of 3 items), the social environment (consisting of 3 items), and government policy (consisting of 5 items). The perceived usefulness variable comprises 10 items measuring usefulness, while the Perceived Ease of Use variable includes 10 items assessing ease of use. Moreover, the variable of blended learning adoption is assessed through four items pertaining to blended learning. All of these variables serve as reference [15], [16], [20], [21], [22], [23].

2.5. Blended Learning

Blended learning (BL) is commonly described as an educational technique that integrates conventional in-person teaching methods with online learning methods. It enables educators and students to leverage the advantages of both techniques, facilitating adaptability and creativity in the dissemination of content and interactions [24]. With integrating the two types of learning, blended learning allows students to acquire a thorough comprehension of the material, improving the learning process [25].

Preliminary research indicates that BL has the potential to enhance learning motivation, learning outcomes, and social interactions [1], [2]. According to [26], BL can enhance an individual's traits. The study conducted by [27] found that implementing blended learning in student education can lead to improved academic performance. Students have increased autonomy over their study schedule while still receiving advice from the speaker. BL offers a significant benefit in terms of its flexibility in obtaining instructional resources. Students can retrieve materials from the internet at any time and in any location, enabling them to engage in a more flexible and personalized learning experience [28], [29].

Although blended learning presents numerous advantages, it also confronts significant challenges including the need to expand technological infrastructure, provide adequate training for lecturers, and design effective curricula [30]. Key challenges in implementing blended learning involve technological barriers, such as limited internet access or inadequate devices. Teacher readiness is another issue, where lecturers may need further training to integrate technology effectively into their teaching. Additionally, learning design requires meticulous planning to seamlessly blend online and face-to-face components.

2.6. Technology, Organization, and Environment

Blended learning is commonly described as an educational technique that integrates conventional in-person teaching methods with online learning methods. The TOE model is utilized for the analysis of the internal and external aspects that affect a particular environment's technology adoption. It includes the organizational, environmental, and technological components [31], [32], [33], [34]. The TOE framework is employed in a number of research that examine how innovation is implemented in the use of information technology [35], [36] Technology adoption and implementation processes are impacted by a number of characteristics that are identified using TOE model [37], [38].

The TOE framework transcends the limits of an organization, including the limitations and possibilities linked to the high-tech revolution. The TOE framework's wide application renders it useful for several disciplines, enabling researchers to choose dimensions depending on innovation and organizational features [39]. The TOE framework is a theoretical model that posits the existence of three distinct elements that exert an effect on technology-related decision-making processes. The three variables that are believed to drive technological innovation are technology, organization, and environment [40], [41], [42]. Figure 2 depicts the relationship between technical factors inside an organization and the adoption of technological innovation.

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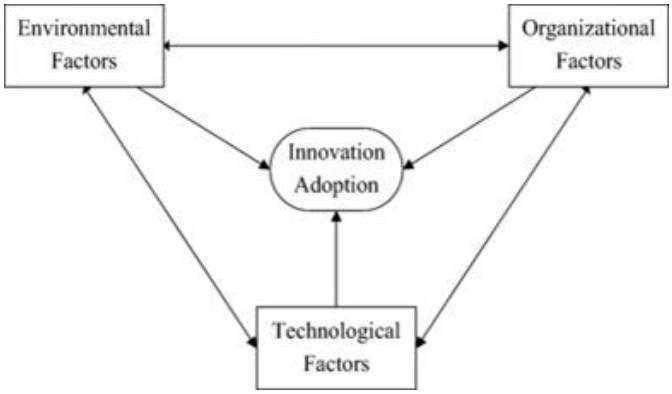

Figure 2. Technology, Organization, and Environment Framework

These elements are shown as features of information technology that drive innovation and have an impact on the company's decision to adopt new technologies [43], [32]. The technical context encompasses all pertinent technologies within an organization, including both those already utilized and those that are available but not yet implemented. Multiple research has also demonstrated that technology encompasses indices of perceived usefulness, relative superiority, and compatibility [43], [44]. Existing technology within an organization plays a crucial role in the adoption process as it establishes overall boundaries on the extent and pace at which technological advancements may be implemented by the business [40] Organizations depends heavily on the productivity of their workforce, which affects the workers' individual performance [45]. Organizations must thoroughly evaluate the impact of using a new technology and take into account the organization's available resources for technology adoption [46] The primary area of investigation is the impact of technological attributes on the adoption process [20].

2.7. Technology Acceptance Model (TAM)

A popular approach for examining and predicting people's adoption of technology is TAM, which seen in figure 3 [47], [48], [49], [50]. It was developed by [15] and is based on two key factors: perceived usefulness, which refers to a person's confidence in the technology's ability to enhance performance, and perceived ease of use, which relates to a person's confidence in the technology's convenience [51], [52], [53]. Previous research studies have demonstrated that TAM provides a more comprehensive explanation of people's adoption of information technology [54], [55].

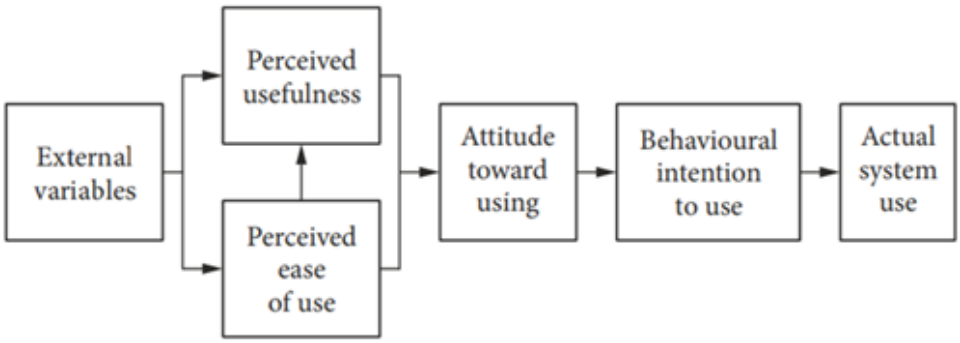

Figure 3. TAM framework

According to TAM, people are more inclined to adopt and utilize a technology if they perceive it as both beneficial and easy to use. It aligns with behavioral theory, which highlights those attitudes toward an object or action can forecast behavioral intentions and actual conduct. The TAM helps elucidate the underlying factors and consequences of individuals' beliefs, behavior, intentions, and actual behavior when utilizing information technologies [56].

In the context of education, TAM has been used to clarify and predict how well students and teachers will accept online learning platforms, particularly when BL, or e-learning, is implemented. Perceived ease of use can be influenced by factors such as a user-friendly interface, technical assistance, and training materials. On the other hand, perceived utility can be increased by interactive features and relevant content.

2.8. E-Readiness

The availability of the brain ware, or in this case, the ICT users themselves, is a determining factor in the success of introducing and adopting new technologies, especially ICT in an organization [57]. E-readiness pertains to the degree of preparedness of a country, organization, or individual to effectively employ ICT to accomplish specific objectives [58]. In the educational environment, digital readiness refers to the capacity and willingness of educational institutions, teachers, and students to effectively use digital technology as a tool to enhance the teaching and learning process, particularly in the blended learning paradigm.

E-readiness is essential as the effectiveness of implementing BL is highly contingent on the preparedness of institutions, lecturers, and students to utilize technology effectively. Indicators of e-readiness include the availability of e-learning platforms, the proficiency of lecturers in managing and delivering online information, and the adaptability of students to this learning style.

3. Results and Discussion

3.1. Dataset Analysis

This study commenced with a preliminary investigation designed to authenticate the research tool. The pilot study required a minimum of 30 respondents to distribute the questionnaire, according to statistical recommendations, which state that a sample size of at least 30 ($n \geq 30$) to validate the assumption of a normal distribution. This preliminary study included a sample of 50 participants from four state Islamic universities, specifically UIN Syarif Hidayatullah Jakarta, UIN Sunan Gunung Djati Bandung, UIN Sunan Kalijaga Yogyakarta, and UIN Maulana Malik Ibrahim Malang.

The purpose of individual reliability indicator testing is to determine the loading factor, which quantifies the strength of the connection between each indicator and the variable construct. The loading factor is considered genuine when it exceeds 0.7, although a value of 0.6 can also be acceptable [59]. The results demonstrate that all indicators possess a value surpassing 0.7, signifying their validity and readiness for subsequent testing, including internal consistency reliability testing.

The subsequent phase involves doing internal consistency reliability testing. This examination focuses on composite reliability (CR), with a threshold of 0.7 considered desirable, while a value of 0.6 is still deemed acceptable [60]. The results indicate that the overall indicator has exceeded a value of 0.6, and it is recommended to proceed with the next test if the value reaches 0.7.

The following criteria examines the average variance extracted (AVE) value, and which can't be less than the minimum threshold of 0.5 [60]. The results indicate that the overall indication exceeds 0.5 and can be implemented in the subsequent test. Evaluating the discriminant validity value is performed through two approaches. Firstly, the indicator values of the outer loading for the variables within their own block and with variables in other blocks are compared. The results indicate that both the outer loading and Fornell-lacker criterion values meet the necessary conditions, thereby confirming their validity. Data from 50 participants in the pilot study were examined, and it was found that the questionnaire's validity and reliability were above the minimal criterion, indicating that it is of high quality. Consequently, the researcher did not make any modifications to the proposed variables for this study.

3.1.1. Demographic Results

Data collection from respondents took place over 21 days, specifically from October 26, 2023, to November 15, 2023. A total of 249 respondents provided their replies. Demographic information encompasses age, gender, educational background, duration of internet usage, and the specific information technology employed. Out of the 249 participants, the demographic profile is as follows:

1) Female respondent: 144.
2) Respondents aged 19 – 23 years: 213.
3) Student respondents: 218.
4) 7th-semester student respondents are 115 out of 218.
5) Respondents from UIN Syarif Hidayatullah Jakarta: 112.

6) Respondents from the Faculty of Science and Technology: 150.
7) The Information Systems Study Program dominated respondents: 67.
8) Respondents who use offline and online learning systems (hybrid): 202.
9) Respondents from universities that have implemented the BL system: 248.
10) Respondents have predominantly implemented blended learning for 1-2 years: 147.
11) Respondents predominantly use the Google Meet application as the application used in Blended Learning: 227.
12) Respondents who implement blended learning can improve the quality of learning: 228.

3.1.2. Outer Model

3.1.2.1. Individual Indicator Reliability

Initially, it is imperative to verify the loading indicator. Values beyond 0.708 are advised since they signify that the construct accounts for over 50 percent of the variation in the indicator, hence ensuring satisfactory item dependability [61] . The results of the outer loading calculation indicate that 12 indicators were excluded due to their value being less than 0.708

3.1.2.2. Internal Consistency Reliability

In this phase of the testing procedure, the Cronbach's alpha (CA) value is investigated; a value above 0.70 shows acceptable reliability. Additionally, CR value, which is regarded as good, is often above 0.70 [61]. These values can be found in table 1. The CR calculation results indicate that all indicators have a value exceeding 0.70, therefore enabling them to proceed to the subsequent test.

Table 1. Composite Reliability (CR)

Variable	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)
Blended Learning Adoption	0.838	0.838	0.891
Environment	0.925	0.925	0.937
Organizational	0.937	0.938	0.947
Perceived Ease of Use	0.946	0.947	0.954
Perceived Usefulness	0.951	0.952	0.959
Technology	0.918	0.919	0.931

3.1.2.3. Convergent Validity

When AVE is 0.50 or above, it is considered satisfactory because it indicates that the construct explains at least 50% of the variation in the items [61]. The AVE calculation results demonstrate that the indicator's total value exceeds 0.5, thereby warranting its continuation to the next test as shown in table 2.

Table 2. Average Variance Extracted (AVE)

Variable	AVE
Blended Learning Adoption	0.673
Environment	0.576
Organizational	0.643
Perceived Ease of Use	0.674
Perceived Usefulness	0.717
Technology	0.501

3.1.2.4. Discriminant Validity

The outer loading indicators' outcomes for the variables under examination are juxtaposed with those of variables in other blocks to evaluate discriminant validity. The cross-loading values for each item exceed 0.5 in the computation results. Next, compute the Fornell-Larcker Criterion value as an alternative method. The requirement is that this

variable's value must exceed that of the other variables. The Fornell-Larcker Criterion value exceeds 0.7. Furthermore, if the heterotrait monotrait ratio (HTMT) value is below 0.90, it indicates that there is discriminant validity.

The results of these four tests are considered ideal and satisfy the requirements of each test, which permits the move on to the next stage, which is the assessment of the structural model (inner model).

3.1.3. Inner Model

3.1.3.1. Variance Inflation Factor (VIF)

Prior to conducting the structural model analysis, it is imperative to assess the presence of multicollinearity among variables and the Inner VIF. The VIF value is commonly employed to assess the collinearity of formative indicators. Optimally, the VIF values should be approximately 3 or less, as stated by [61] We may conclude that there doesn't exist multicollinearity among the variables based on the data, indicating that the inner VIP value is less than 5. Table 3 below is the results obtained from the Inner VIF Test.

Table 3. Inner VIF Test

Relationship Between Variables	VIF
Technology → Perceived Usefulness	2.634
Technology → Perceived Ease of Use	1.446
Organizational → Perceived Usefulness	1.461
Organizational → Perceived Ease of Use	1.446
Environment → Blended Learning Adoption	2.003
Perceived Ease of Use → Perceived Usefulness	2.350
Perceived Ease of Use → Blended Learning Adoption	1.601
Perceived usefulness → Blended Learning Adoption	2.067

3.1.3.2. Testing Hypothesis Results

Validating the study hypothesis by employing a bootstrapping technique with a subsample size of 5000. According to the test results, the 2-tailed test has t-values of 1.96 at a significance level of 5. Determine the p-value for every assessment and contrast it with a predetermined alpha threshold of 0.01 or 0.05. There is a statistically significant association between the variables if the p-value < 0.05 [61]. The outcome of the hypothesis test calculations is displayed in table 4 and figure 4 shown the result from SmartPLS.

Table 3. Hypothesis Testing

Path coefficients	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
Technology → Perceived Usefulness	0.242	0.237	0.091	2.661	0.008
Technology → Perceived Ease of Use	0.711	0.711	0.055	12.816	0.000
Organizational → Perceived Usefulness	0.339	0.337	0.071	4.767	0.000
Organizational → Perceived Ease of Use	0.079	0.082	0.062	1.279	0.201
Environment → Blended Learning Adoption	0.305	0.309	0.065	4.687	0.000
Perceived Ease of Use → Perceived Usefulness	0.227	0.236	0.105	2.166	0.030
Perceived Ease of Use → Blended Learning Adoption	0.291	0.292	0.058	5.051	0.000
Perceived usefulness → Blended Learning Adoption	0.421	0.416	0.058	7.222	0.000

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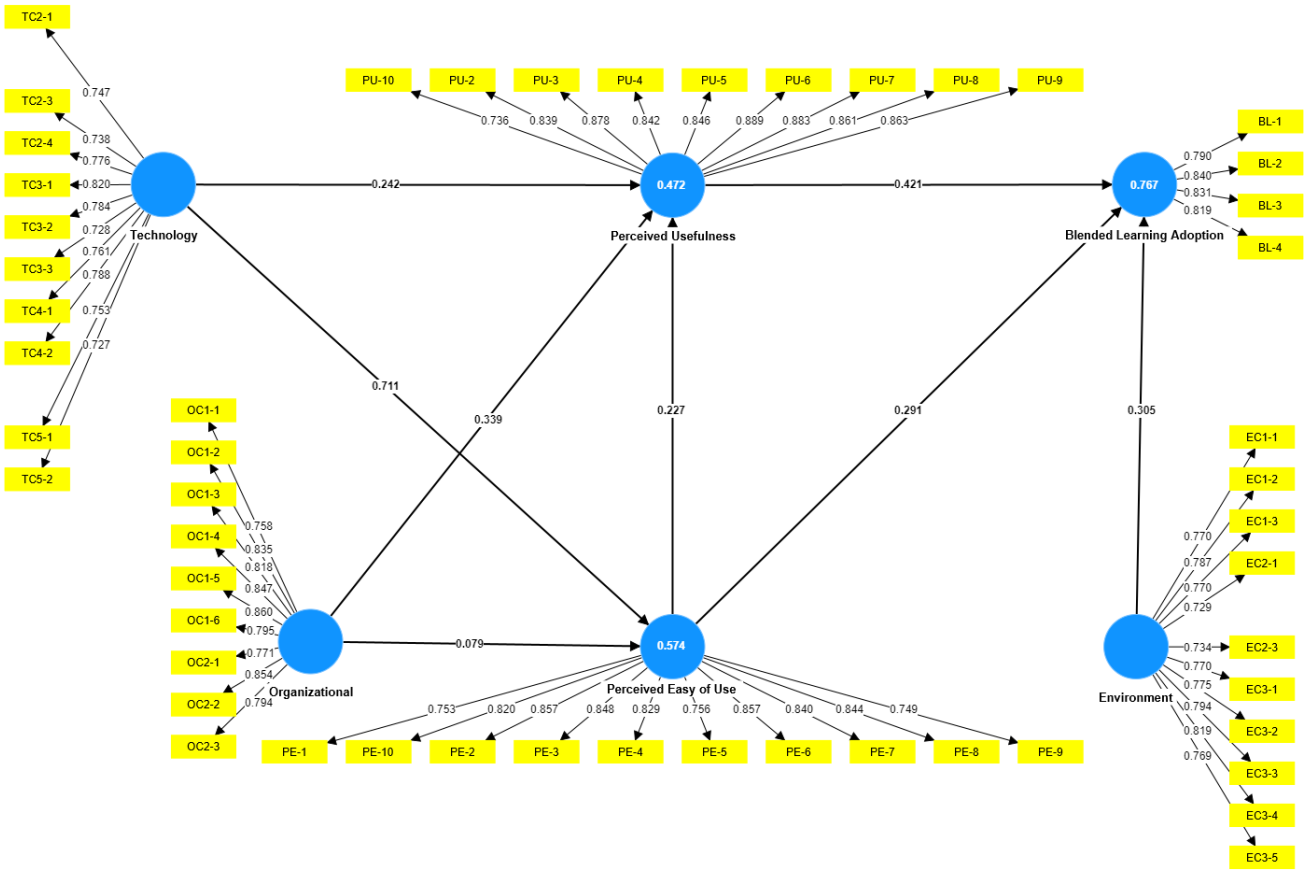

Figure 4. SmartPLS Results

In table 4, all factors except for the link between Organizational and Perceived Ease of Use do not demonstrate statistical significance. It is indicated by the t-value (1.279 < 1.66) and p-value (0.201 > 0.05). Technological elements exert a substantial impact on both the perceived ease of use and perceived usefulness. These perceived aspects, in turn, significantly influence the adoption of BL learning.

3.1.3.3. Path Coefficient

The determination of a significant path coefficient value at the 95% confidence level can be made by examining the confidence intervals derived from the bootstrapping procedure. Table 5 demonstrates that, with the exception of the link between Organizational and Perceived Ease of Use, the calculation results indicate that the confidence interval does not include zero. It suggests that the association is statistically significant. A confidence interval that intersects with zero in the context of Organizational→Perceived Ease of Use suggests an unstable link that may lack significance in various samples or bigger populations.

Table 4. Path Coefficient 95% Confidence Interval Test

Confidence Intervals	Original sample (O)	Sample mean (M)	2.5%	97.5%
Technology → Perceived Usefulness	0.242	0.237	0.063	0.418
Technology → Perceived Ease of Use	0.711	0.711	0.597	0.814
Organizational → Perceived Usefulness	0.339	0.337	0.195	0.474
Organizational → Perceived Ease of Use	0.079	0.082	-0.040	0.206
Environment → Blended Learning Adoption	0.305	0.309	0.187	0.441
Perceived Ease of Use → Perceived Usefulness	0.227	0.236	0.031	0.444
Perceived Ease of Use → Blended Learning Adoption	0.291	0.292	0.180	0.402
Perceived usefulness → Blended Learning Adoption	0.421	0.416	0.298	0.524

 ISSN 2723-6471

3.1.3.4. Effect Size

In this analysis, the effect size value (f^2) is explored, with a benchmark of approximately 0.02 indicating a minor impact, 0.15 indicating a moderate impact, and 0.35 indicating a significant impact. Conversely, if the effect size value is below 0.02, it means that it does not have any impact on the structure of the model [61]. The computation outcomes are displayed in table 6. The results indicate that out of the 8 paths now in existence, 3 pathways fall under the medium influence category, 2 pathways fall under the small influence category, 2 pathways fall under the large influence category, and 1 pathway falls under the category of having no effect.

Table 5. Effect Size Testing (f^2)

Hypothesis	Relationship between paths	f^2	Results
H1	Technology → Perceived Usefulness	0.042	Weak
H2	Technology → Perceived Ease of Use	0.821	Strong
H3	Organizational → Perceived Usefulness	0.149	Weak
H4	Organizational → Perceived Ease of Use	0.010	No effect
H5	Environment → Blended Learning Adoption	0.199	Medium
H6	Perceived Ease of Use → Perceived Usefulness	0.042	Weak
H7	Perceived usefulness → Blended Learning Adoption	0.367	Strong
H8	Perceived Ease of Use → Blended Learning Adoption	0.227	Medium

3.1.4. Model Fit Evaluation

3.1.4.1. Coefficient of Determination (R-Square)

As stated by [61], R^2 values of 0.75, 0.50, and 0.25, respectively, show that the influence is significant (high), moderate, and modest. The computation outcomes are visible in table 7. The findings indicate that all variables that are dependent on other factors are classified inside the middle category.

Table 6. Coefficient of Determination (R-Square)

Variable	R^2	Results
Blended Learning Adoption	0.767	High
Perceived Ease of Use	0.574	Medium
Perceived Usefulness	0.472	Medium

3.1.4.2. Predictive Relevance (Q^2)

Testing is conducted using the PLSpredicy/CVPAT technique, and a Q^2 value greater than 0 is required to observe a link. Q^2 is assigned values of 0, 0.25, and 0.50, which correspond to low, medium, and high levels of predicted accuracy. The computation outcomes are displayed in table 8. The results indicate that all variables associated with each variable exhibit values greater than 0.

Table 7. Predictive Relevance (Q^2)

Variable	Q^2	Results
Blended Learning Adoption	0.599	High
Perceived Ease of Use	0.562	High
Perceived Usefulness	0.437	Medium

3.1.4.3. Standardized Root Mean Square Residual (SRMR)

The statistic called SRMR is employed to evaluate a model's goodness of fit. It quantifies the discrepancy between the correlation matrix of the observed data and the correlation matrix calculated by the model. SRMR values below 0.08 are indicative of a good model fit according to the rule of thumb. The computation outcomes are visible in table 9.

Based on the results, it can be concluded that the model is fit because the SRMR value is below 0.08. The suggested model accurately corresponds to the observed data. The predicted findings of the model correlation matrix closely approximate the correlation matrix derived from the empirical data.

Table 8. Relative Impact

Model Fit	Saturated Model	Estimated Model
SRMR	0.068	0.074

3.1.4.4. PLS Predict

PLS Predict is a method used to assess the predictive capability of a proposed PLS model. In their stud, [61] examined the Q^2 predicted value at the indicator level of the PLS model. They found that, overall, most of the PLS model indicators had a higher Q^2 predict value compared to the LM model. Lower values of RMSE and MAE imply that the model has superior prediction capability. The calculations show that if compared to the partial least squares (PLS) model and the linear regression (LM) model, the BL-3 measurement items have a reduced root mean square error (RMSE) value. The measurement items BL-3, BL-4, PE-5, PU-3, PU-5, and PU-6 of the PLS model exhibit lower Mean Absolute Error (MAE) values compared to the LM model (linear regression). Out of the 23 measurements, PLS-SEM outperforms LM in terms of RMSE and MAE for 6 indicators. Therefore, the PLS SEM model has moderate predictive capability.

3.2. Discussion

The evaluation of the conducted model has shown multiple significant conclusions. Regarding the coefficient of determination (R^2), the R^2 value is high for the blended learning adoption variable (0.767), medium for perceived ease of use (0.574) and perceived usefulness (0.472). It indicates that the model is capable of effectively explaining differences in the observed data. More precisely, the use of blended learning has the greatest impact on this paradigm. Furthermore, in terms of the Predictive Relevance (Q^2) component, all variables exhibit values that surpass 0. Notably, Blended Learning Adoption and Perceived Ease of Use demonstrate higher levels of predictive relevance compared to Perceived Usefulness. It suggests that the model can generate predictions with a satisfactory level of precision.

Furthermore, it is essential to take into account SRMR when evaluating the model's fit to the empirical data. A SRMR value below 0.08 indicates a strong fit between the model and the observed data, suggesting that the model accurately represents the correlation within the data. The PLS Predict results demonstrate that the PLS model possesses sufficient predictive capability, as seen by its reduced RMSE and MAE values in comparison to the linear regression model across several indices (6 out of 23 observations). The BL-3 measurement item demonstrates a higher RMSE value in the PLS model in contrast to the LM model. The measurement items BL-3, BL-4, PE-5, PU-3, PU-5, and PU-6 of the PLS model exhibit greater MAE values compared to the LM model (linear regression). In summary, this assessment demonstrates that the model exhibits a high level of accuracy and robust predictive capability.

4. Conclusion

This study utilizes two methods, TOE and TAM, to examine the blended learning system in state Islamic universities. In this research, the adoption of blended learning in higher education institutions using the TAM and TOE model has never been found in previous research. The results of the research highlight the factors that affect blended learning's effective adoption in public Islamic colleges. These factors are determined based on 8 proposed hypotheses, out of which 7 hypotheses are accepted. Several of the accepted hypotheses are as follows: The environment affects the adoption of blended learning, perceived usefulness influences the adoption of blended learning, perceived ease of use influences the adoption of blended learning, and technology influences perceived usefulness, perceived ease of use, organizational factors, and blended learning adoption.

The T-statistic analysis reveals that the factor with the greatest influence is the relationship between technological context and perceived ease of use (H2), which has a highly significant T-statistic of 12.816, indicating that features such as intuitive interface design, easy navigation, and information accessibility play crucial roles in facilitating a hassle-free user experience, thus strengthening the inclination of both students and lecturers to use the system in their

learning activities. It is followed by the influence of perceived ease of use on BL adoption (H8) with a value of 5.051, emphasizing the importance of an intuitive and accessible system design that enhances comfort and ease for students and lecturers, encouraging broader adoption in the academic environment of PTKIN. The value of perceived usefulness on BL adoption (H7) at 7.222 highlights the importance of ensuring that the blended learning system is not only easy to use but also perceived as an effective and useful tool in the educational context, promoting broader implementation among PTKIN students. Other significant factors include the organizational context on perceived usefulness (H3), with a value of 4.767, showing that the organization plays a crucial role in ensuring that learning tools are not only available but also perceived as beneficial and relevant to their education. The influence of environmental context on BL adoption (H5) at 4.687 affirms that the surrounding conditions of students, lecturers, and institutions support the use of this learning technology, thus enhancing the adoption of blended learning systems at PTKIN. Furthermore, the value of 2.166 for the association between perceived ease of use and perceived usefulness (H6) confirms that the technological elements included in distance learning applications, such as ease of access, interactive features, and platform reliability, are significant in shaping students' positive perceptions of the effectiveness of blended learning systems at their institutions. Lastly, the value of 2.661 for the relationship between technological context and perceived usefulness (H1) underscores the importance of intuitive and user-friendly system design in enhancing students' confidence in the value and effectiveness of blended learning systems in their educational context. Moreover, the non-significant, as indicated by a score of 1.279, result for the association between organizational environment and perceived ease of use (H4) implies that aspects such as organizational structure, policies, resources, and support provided by PTKIN do not hinder or complicate the use of the system by students. In other words, from the students' perspective, organizational factors do not add difficulty in using the provided learning technology.

Additionally, environmental factors directly affect the integration of blended learning. The efficacy of incorporating blended learning at state Islamic universities has been substantiated by a survey that included 249 participants, comprising both students and lecturers. It demonstrates an enhancement in the caliber of education. Out of the 228 respondents, 92% believed that blended learning enhances the quality of learning, while 8% expressed a contrary opinion.

To ensure the validity of future research, it is imperative to critically examine the variable constructions employed in order to prevent the emergence of connection outcomes that are deemed invalid and statistically insignificant. Additionally, enhancing the TAM-TOE model by including another model to optimize the outcomes. The perceived ease of use of blended learning in a state Islamic university environment can be enhanced by considering the organizational context variable. Future research should consider exploring the differences in perceptions between students and lecturers. Understanding these stakeholder perspectives can provide diverse insights into the challenges and opportunities of implementation, further enriching our comprehension of blended learning's effectiveness and adaptability in higher education.

5. Declarations

5.1. Author Contributions

Conceptualization: N.A.H., Q.A., and P.G.; Methodology: Q.A.; Software: P.G.; Validation: N.A.H., Q.A., and P.G.; Formal Analysis: N.A.H., Q.A., and P.G.; Investigation: N.A.H.; Resources: Q.A.; Data Curation: Q.A.; Writing Original Draft Preparation: N.A.H. and Q.A.; Writing Review and Editing: Q.A., N.A.H., and P.G; Visualization: P.G.; All authors have read and agreed to the published version of the manuscript.

5.2. Data Availability Statement

The data presented in this study are available on request from the corresponding author.

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5.4. Institutional Review Board Statement

Not applicable.

5.5. Informed Consent Statement

Not applicable.

5.6. Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

[1] F. Harahap, N. E. A. Nasution, and B. Manurung, "The Effect of Blended Learning on Student's Learning Achievement and Science Pro_cess Skills in Plant Tissue Culture Course," *Int. J. Instr.*, vol. 12, no. 1, pp. 521–538, 2019, doi: https://eric.ed.gov/?id=EJ1201370.

[2] Yustina, W. Syafii, and R. Vebrianto, "The Effects of Blended Learning and Project-Based Learning on Pre-Service Biology Teachers' Creative Thinking Skills Through Online Learning in The COVID-19 Pandemic," *J. Pendidik. IPA Indones.*, vol. 9, no. 3, pp. 408–420, 2020, doi: 10.15294/jpii.v9i3.24706.

[3] Y. Jeon, J. Kim, W. Choi, and D. S.-I. Na, "Developing The Competencies Of Vocational Teachers In The Age Of 4th Industrial Revolution," *in 13th AASVET International Conference, 2017*, vol. 13, no. 1, pp. 93–93. [Online]. Available: https://www.earticle.net/Article/A331541

[4] T. Resmiaty, U. A. Chaeruman, and D. Kusumawardani, "The Implementation of Blended Learning in The New Normal Era at Vocational School of Health," *J. Pendidik. Vokasi*, vol. 11, no. 2, pp. 182–191, 2021, doi: 10.21831/jpv.v11i2.42495.

[5] A. Schleicher, "The Impact of COVID-19 on Education: Insights from 'Education at a Glance 2020,'" *ERIC*. Accessed: May 03, 2024. [Online]. Available: https://eric.ed.gov/?id=ED616315

[6] Humas Ditjen Dikti. "Dirjen Dikti: Tri Dharma Perguruan Tinggi Tidak Berhenti Meski Pandemi Covid-19." Kemdikbud.go.id. https://www.kemdikbud.go.id/main/blog/2020/10/dirjen-dikti-tri-dharma-perguruan-tinggi-tidak-berhenti-meski-pandemi-covid19 (accessed Nov 5, 2023)

[7] M. G. Moore and G. Kearsly, "Distance Education: a Systems View of Online Learning," *Taylor Fr*. Online, vol. 72, no. 6, pp. 800-800, 2020, doi: 10.1080/00131911.2020.1766204.

[8] H. A. Maulana and M. Hamidi, "Persepsi Mahasiswa terhadap Pembelajaran Daring pada Mata Kuliah Praktik di Pendidikan Vokasi," *J. Pendidik.*, vol. 8, no. 2, pp. 224–231, 2020, doi: 10.26618/equilibrium.v8i2.3443.

[9] M. Sholichin, Z. Zulyusri, L. Lufri, and A. Razak, "Analisis Kendala Pembelajaran Online Selama Pandemi Covid-19 Pada Mata Pelajaran IPA di SMPN 1 Bayung Lencir," *Biodik*, vol. 7, no. 2, pp. 163–168, 2020, doi: 10.22437/bio.v7i2.12926.

[10] L. Harasim, Learning Theory and Online Technologies, 2nd Editio. New York: Routledge, 2017.

[11] C. J. Bonk and C. R. Graham, The Handbook of Blended Learning: Global Perspectives, Local Designs. San Francisco: Pfeiffer Publishing, 2012.

[12] Tsuwaybah Al Aslamiyah, P. Setyosari, and H. Praherdhiono, "Blended Learning dan Kemandirian Belajar Mahasiswa Teknologi Pendidikan," *Proceeding 1st Int. Conf. Educ. Soc. Humanit.*, vol. 2, no. 2, pp. 109–114, 2023, doi: 10.17977/um038v2i22019p109.

[13] W. W. Porter, C. R. Graham, K. R. Spring, and K. R. Welch, "Blended learning in higher education: Institutional adoption and implementation," *Comput. Educ.*, vol. 75, no. 1, pp. 185–195, 2014, doi: 10.1016/j.compedu.2014.02.011.

[14] F. Sayekti and P. Putarta, "Penerapan Technology Acceptance Model (TAM) Dalam Pengujian Model Penerimaan Sistem Informasi Keuangan Daerah," *J. Manaj. Teor. dan Ter. J. Theory Appl. Manag.*, vol. 9, no. 3, pp. 196–209, 2016, doi: 10.20473/jmtt.v9i3.3075.

[15] F. D. Davis, "Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology," *MIS Quarterly.*, vol. 13, no. 5, pp. 319–339, 1989, doi: 10.2307/249008.

[16] S. Tripopsakul, "Social Media Adoption as a Business Platform: An Integrated TAM-TOE Framework," *Polish J. Manag.*

Stud., vol. 18, no. 2, pp. 350–362, 2018, doi: 10.17512/pjms.2018.18.2.28.

[17] J. F. J. Hair, G. T. M. Hult, C. M. Ringle, and M. Sarstedt, A Primer on Partial Least Square Structural Equation Modelling (PLS-SEM). Sage Publication, 2017.

[18] Sugiyono, Metode Penelitian Kuantitatif, Kualitatif dan R&D. Bandung: Penerbit Alfabeta, 2011.

[19] A. Chiniah, A. E. U. Mungur, and K. N. Permal, "Evaluation of Cloud Computing Adoption Using a Hybrid TAM/TOE Model," *in Proc. of Fifth International Conference INDIA*, 2018, vol. 2, no. 1, pp. 257–269.

[20] E. M. Rogers, Diffusion of Innovations (Fourth Edition). New York: The Free Press, 1995.

[21] Y. Lai, H. Sun, and J. Ren, "Understanding The Determinants of Big Data Analytics (BDA) Adoption in Logistics and Supply Chain Management: An Empirical Investigation," *Int. J. Logist. Manag*., vol. 29, no. 2, pp. 676–703, 2018, doi: 10.1108/IJLM-06-2017-0153.

[22] Y. Li, Q. Wang, and J. Lei, "Modeling Chinese Teachers' Attitudes Toward Using Technology for Teaching with a SEM Approach," *Taylor Fr. Online*, vol. 36, no. 2, pp. 122–141, 2019, doi: 10.1080/07380569.2019.1600979.

[23] H.-F. Lin, "Understanding the Determinants of Electronic Supply Chain Management System Adoption: Using the Technology–Organization–Environment Framework," *Technol. Forecast. Soc. Chan*ge, vol. 86, no. 1, pp. 80–92, 2014, doi: 10.1016/j.techfore.2013.09.001.

[24] F. Chen, A. M. Lui, and S. M. Martinell, "A Systematic Review of the Effectiveness of Flipped Classrooms in Medical Education," *pubmed*, vol. 51, no. 6, pp. 585–597, 2017, doi: 10.1111/medu.13272.

[25] A. M. Bliuc, P. Goodyear, and R. A. Ellis, "Research Focus and Methodological Choices in Studies Into Students' Experiences of Blended Learning in Higher Education," *Internet High. Educ*., vol. 13, no. 3, pp. 206–221, 2007, doi: https://doi.org/10.1016/j.iheduc.2007.08.001.

[26] M. J. Kintu, C. Zhu, and E. Kagambe, "Blended Learning Effectiveness: The Relationship Between Student Characteristics, Design Features and Outcomes," *Int. J. Educ. Technol. High. Educ*., vol. 14, no. 1, pp. 1-7, 2017, [Online]. Available: https://docs.edtechhub.org/lib/XLMQ36GN

[27] V. K. Ceylan and A. Elitok Kesici, "Effect of Blended Learning to Academic Achievement," *J. Hum. Sci*., vol. 14, no. 1, pp. 308-320, 2017, doi: 10.14687/jhs.v14i1.4141.

[28] B. Means, Y. Toyoma, R. Murphy, M. Bakia, and K. Jones, "Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies," 2019. [Online]. Available: https://eric.ed.gov/?id=ED505824

[29] J. S. Martin, J. E. Kreiger, and A. L. Apicerno, "Effectiveness of a Hybrid Classroom in the Delivery of Medical Terminology Course Content Relative to a Traditional Classroom Format," *J. Scholarsh. Teach. Learn*., vol. 15, no. 5, pp. 72–81, 2015, doi: 10.14434/josotl.v15i5.13994.

[30] R. M. Conrad and J. A. Donaldson, Engaging the Online Learner: Activities and Resources for Creative Instruction. 2011.

[31] J. L. Chong and K. Olesen, "A Technology-Organization-Environment Perspective on Eco-effectiveness: A Meta-analysis," *Australas. J. Inf. Syst*., vol. 21, no. 1, pp. 1–26, 2017, doi: 10.3127/ajis.v21i0.1441.

[32] L. H. Mahirah, K. Sisilia, and R. Setyorini, "Analisis TOE Mempengaruhi Adopsi Media Sosial Untuk Produk UMKM Di Sentra Kreasi Kabupaten Bandung," *J. Ilm. Manajemen, Ekon. Akunt*., vol. 6, no. 3, pp. 176–194, 2022, doi: 10.31955/mea.v6i3.2247.

[33] Y. Religia, M. Ekhsan, M. Huda, and A. D. Fitriyanto, "TOE Framework for E-Commerce Adoption by MSMEs during The COVID-19 Pandemic: Can Trust Moderate?," *Appl. Inf. Syst. Manag*., vol. 6, no. 1, pp. 47–54, 2023, doi: 10.15408/aism.v6i1.30954.

[34] Y. Religia, S. Surachman, F. Rohman, and N. K. Indrawati, "E-Commerce Adoption in SMEs: A Literature Review," in *Proc. of the 1st International Conference on Economics Engineering and Social Science*, 2020, vol. 1, no. 1, pp. 1–9, 2020, doi: 10.4108/eai.17-7-2020.2302969.

[35] S. Chandra and K. N. Kumar, "Exploring Factors Influencing Organizational Adoption of Augmented Reality in E-Commerce: Empirical Analysis Using Technology–Organization–Environment Model," *J. Electron. Commer. Res*., vol. 18, no. 3, pp. 237–265, 2018, doi: http://www.jecr.org/node/556.

[36] O. Ali, A. Shrestha, V. Osmanaj, and S. Muhammed, "Cloud Computing Technology Adoption: an Evaluation of Key Factors

in Local Governments," *Inf. Technol. People*, vol. 34, no. 2, pp. 666–703, 2021, doi: https://doi.org/10.1108/ITP-03-2019-0119.

[37] Sukardi, Hasyim, and Supriyantoro, "Using the Technology-Organization-Environment Framework Approach in the Acceptance of Telemedicine in the Health Care Industry," *Eur. J. Bus. Manag. Res*., vol. 6, no. 3, pp. 47–54, 2021, doi: 10.24018/ejbmr.2021.6.3.837.

[38] L. G. Tornatzky and M. Fleischer, The process of technological Innovation. Lexington MA: D.C. Heath & Company, 1990.

[39] I. Ahmed, "Technology Organization Environment Framework in Cloud Computing," *Telkomnika (Telecommunication Comput. Electron. Control*., vol. 18, no. 2, pp. 716–725, 2020, doi: 10.12928/TELKOMNIKA.v18i2.13871.

[40] J. Baker, "The Technology-Organization-Environment Framework," in *Integrated series on information systems/Integrated series in information systems*, 2011, vol 1, no. 1, pp. 231–245. doi: https://doi.org/10.1007/978-1-4419-6108-2_12.

[41] T. H. Nguyen, X. C. Le, and T. H. L. Vu, "An Extended Technology-Organization-Environment (TOE) Framework for Online Retailing Utilization in Digital Transformation: Empirical Evidence from Vietnam," *J. Open Innov. Technol. Mark. Complex*., vol. 8, no. 4, pp. 1-22, 2022, doi: 10.3390/joitmc8040200.

[42]]L. Hashimy, G. Jain, and E. Grifell-Tatjé, "Determinants of blockchain adoption as decentralized business model by Spanish firms – an innovation theory perspective," *Ind. Manag. Data Syst*., vol. 123, no. 1, pp. 204–228, Feb. 2023, doi: 10.1108/IMDS-01-2022-0030.

[43] S. S. Abed, "Social commerce adoption using TOE framework: An empirical investigation of Saudi Arabian SMEs," *Int. J. Inf. Manage.*, vol. 53, no. 1, p. 102118, Aug. 2020, doi: 10.1016/j.ijinfomgt.2020.102118.

[44] N. T. Chau and H. Deng, "Critical Determinants for Mobile Commerce Adoption in Vietnamese SMEs: A Conceptual Framework," *Procedia Comput. Sci.*, vol. 138, no. 1, pp. 433–440, 2018, doi: 10.1016/j.procs.2018.10.061.

[45] M. Q. Huda, R. Irawan, N. Kumaladewi, and M. Y. Koondhar, "Evaluating Social Technology Utilization on Employee Performance Using Positivism Paradigm," *Appl. Inf. Syst. Manag*., vol. 5, no. 2, pp. 91–96, 2022, doi: 10.15408/aism.v5i2.22978.

[46] P. Chwelos, I. Benbasat, and A. S. Dexter, "Empirical test of an electronic data interchange adoption model," *Inf. Syst. Res*., vol. 12, no. 3, pp. 304–321, 2001, [Online]. Available: https://www.jstor.org/stable/23011018

[47] I. A. Khumaidi and R. H. Kusumaningtyas, "Technology Acceptance Model Perilaku Pengguna Pada Sistem Enterprise Dompet Dhuafa," *Appl. Inf. Syst. Manag*., vol. 4, no. 1, pp. 11–16, 2021, doi: 10.15408/aism.v4i1.19484.

[48] L. Setiyani, "Using Technology Acceptance Model 3 (TAM 3) at Selected Private Technical High School: Google Drive Storage in E-Learning," *Utamax J. Ultim. Res. Trends* Educ., vol. 3, no. 2, pp. 80–89, 2021, doi: 10.31849/utamax.v3i2.6746.

[49] A. Palapa and I. Saifudin, "Analisa Pengaruh Technology Acceptance Model (TAM) Pada Aplikasi Pendaftaran Penilaian Training Record Book (Smile 05) Studi Pada PUKP 05 Semarang," *Maj. Ilm. Bahari Jogja*, vol. 19, no. 1, pp. 70–86, 2021, doi: 10.33489/mibj.v19i1.259.

[50] K. R. Siregar, "Kajian Mengenai Penerimaan Teknologi dan Informasi Menggunakan Technology Accaptance Model (TAM)," *Rekayasa*, vol. 4, no. 1, pp. 27–32, 2011, doi: https://doi.org/10.21107/rekayasa.v4i1.2322.

[51] N. Safitri, "Model Kesuksesan Sistem Teknologi Informasi Delone & McLean pada Sistem Informasi Pengelolaan Proyek," *INFORMATICS Educ. Prof. J. Informatics*, vol. 4, no. 2, pp. 173-182, Jun. 2020, doi: 10.51211/itbi.v4i2.1346.

[52] S. R. Wicaksono, Teori Dasar: Technology Acceptance Model. Malang: C.V Seribu Bintang, 2022.

[53] Rinwantin and Y. Pujiastuti, "TAM (Technology Acceptance Model) Approach to Analyze Community's Interest in Using E-money," *J. Appl. Sci. Accounting, Financ. Tax*, vol. 5, no. 1, pp. 1–10, 2022, doi: 10.31940/jasafint.v5i1.1-10.

[54] A. Syafrizal, E. Ernawati, and Y. Dwiandiyanta, "Penerapan Model Technology Acceptance Model (TAM) untuk Pemahaman Media Pembelajaran Berbasis Multimedia Interaktif," *Sci. J. Informatics*, vol. 2, no. 1, pp. 9–14, 2016, doi: 10.15294/sji.v2i1.4524.

[55] P. Legris, J. Ingham, and P. Collerette, "Why do people use information technology? A critical review of the technology acceptance model," *Inf. Manag*., vol. 40, no. 3, pp. 191–204, Jan. 2003, doi: 10.1016/S0378-7206(01)00143-4.

[56] J. D. Portz et al., "Using the Technology Acceptance Model to Explore User Experience, Intent to Use, and Use Behavior of a Patient Portal Among Older Adults With Multiple Chronic Conditions: Descriptive Qualitative Study," *J. Med. Internet*

Res., vol. 21, no. 4, Art. no. e11604, Apr. 2019, doi: 10.2196/11604.

[57] S. M. Sholihah, A. Subiyakto, S. Ratnawati, and M. N. Azizah, "Qualitative Evaluation of User Acceptance Readiness to the Implementation of the Health Center Management Information System (SIMPUS) at the South Tangerang City Health Center," *Appl. Inf. Syst. Manag*., vol. 5, no. 1, pp. 1–6, 2022, doi: 10.15408/aism.v5i1.10589.

[58] R. A. Nugroho and Y. Purbokusumo, "E-Government Readiness: Penilaian Kesiapan Aktor Utama Penerapan E-Government di Indonesia," *Iptek-Kom*, vol. 22, no. 1, pp. 1–17, 2020, doi: 10.17933/iptekkom.22.1.2020.1-17.

[59] I. Ghozali, Structural Equation Modeling, Metode Alternatif Dengan Partial Least Square (PLS). Semarang: Badan Penerbit Universitas Diponegoro, 2014.

[60] W. Abdillah, J. HM, and D. Prabantini, Partial Least Square (PLS): Alternatif Structural Modeling (SEM) Dalam Penelitian Bisnis. Yogyakarta: BPFE-Yogyakarta, 2015.

[61] J. F. Hair, J. J. Risher, M. Sarstedt, and C. M. Ringle, "When to Use and How to Report The Results of PLS-SEM," *Eur. Bus. Rev*., vol. 31, no. 1, pp. 2–24, 2019, doi: 10.1108/EBR-11-2018-0203.