Sains Insani eISSN: [0127-7871]

YouTube in the Eyes of Pre-Service Teachers: Technology Acceptance Model (TAM)

YouTube dari Pandangan Guru Pra-perkhidmatan: Model Penerimaan Teknologi (TAM)

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Article progress
Received: 3 November 2023
Accepted: 17 November 2023
Published: 30 November 2023

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Abstract: This study investigates the perceptions and challenges faced by pre-service teachers when integrating YouTube as an instructional tool for secondary-level students. The present study employed the Technology Acceptance Model (TAM) as a theoretical framework and involved a sample of 138 participants who were pre-service English instructors specializing in the field of English as a Foreign Language (EFL). In order to establish the validity and reliability of our measurement model, we employed a comprehensive quantitative approach, resulting in the development of a reliable scale of 15 items. The analysis of the data was based on eight hypotheses that revolved around crucial variables, including perceived ease of use (PEU), perceived usefulness (PU), attitudes (AT), facilitating condition (FC), and behavioral intention (BI). The results demonstrated statistically significant correlations among the variables that were examined. Notably, FC was significantly predicted by PU, while FC substantially predicted PEU. PEU, in turn, influenced PU and played a pivotal role in shaping AT and BI. Furthermore, PU served as a predictor for AT and BI, and AT played a crucial role in predicting BI. The analysis of the path coefficient indicates that the correlation between FC and PEU shows the highest degree. The correlation between AT and BI has the weakest degree of strength compared to other hypotheses.

Keywords: Pre-Service Teachers, YouTube, Technology Integration, Technology Acceptance Model (TAM);

Abstrak: Kajian ini meneroka persepsi dan cabaran yang dihadapi oleh guru pra-perkhidmatan apabila mengintegrasikan YouTube sebagai alat pengajaran untuk pelajar peringkat menengah. Kajian ini menggunakan Model Penerimaan Teknologi (TAM) sebagai kerangka teori dan melibatkan sampel seramai 138 peserta yang merupakan pengajar Bahasa Inggeris pra perkhidmatan yang mengkhusus dalam bidang Bahasa Inggeris sebagai Bahasa Asing (EFL). Untuk mewujudkan kesahan dan kebolehpercayaan model pengukuran kami, kami menggunakan pendekatan kuantitatif yang komprehensif, dengan menghasilkan pembangunan skala yang boleh dipercayai sebanyak 15 item. Analisis data adalah berdasarkan lapan hipotesis yang berkisar pada pembolehubah penting, termasuk persepsi kemudahan penggunaan (PEU), persepsi kegunaan (PU), sikap (AT), keadaan pemudahcara (FC), dan niat tingkah laku (BI). Keputusan menunjukkan korelasi yang signifikan secara statistik antara pembolehubah yang telah diperiksa. Terutamanya FC telah diramalkan dengan ketara oleh PU, manakala FC dengan ketara meramalkan PEU. PEU pula mempengaruhi PU dan memainkan peranan penting dalam membentuk AT dan BI. Tambahan pula, PU berfungsi

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sebagai peramal untuk AT dan BI, dan AT memainkan peranan penting dalam meramalkan BI. Analisis path coeficient menunjukkan bahawa korelasi antara FC dan PEU menunjukkan darjah tertinggi. Korelasi antara AT dan BI mempunyai tahap kekuatan yang paling lemah berbanding yang lain.

Kata kunci: Guru Pra-Perkhidmatan, YouTube, Integrasi Teknologi, Technology Acceptance Model (TAM);

Introduction

EFL pre-service teachers are preparing to become successful educators by developing skills and knowledge in college, including controlling classroom behavior, creating a supportive learning environment, planning and delivering lessons in line with curriculum standards, and emphasizing inclusive classrooms (Majoko, 2019; Zulkifli et al., 2019). They can apply for teaching jobs in schools or other educational settings after completing their education and training, often receiving additional support and mentoring. One of the most important skills a pre-service teacher must learn is how to use technology effectively in the classroom. By applying their knowledge and skills to the teaching and learning processes, pre-service teachers can serve as role models for their students and help advance technology in education (Çebi et al., 2022; Reisoğlu & Çebi, 2020).

However, implementing technology in education can be challenging due to cost, maintenance, and technical competence requirements (Alvarado et al., 2020; Mohapi et al., 2021; Önalan & Kurt, 2020). Pre-service teachers need to improve student learning by selecting suitable content and addressing ethical, legal, and social issues (Paat & Markham, 2021; Song, 2020). Equal access to technology is another issue, as not all students have access to the same technology and resources. Finding an appropriate balance between utilizing technology to support conventional educational methods and ensuring the continued existence of crucial elements in face-to-face instruction is of the highest priority.

Technology, particularly video-sharing platforms like YouTube, plays a crucial role in enhancing language acquisition and understanding. YouTube allows for the publishing, viewing, and sharing of educational materials across various subjects, making it an ideal tool for pre-service teachers to create instructional videos, access educational materials, and unique video content tailored to students' needs.

YouTube's content covers various themes such as music, humor, education, and entertainment (Vito & Meilinda, 2019). With its accessibility, ease of use, and wide range of instructional information, YouTube is becoming a popular teaching tool among teachers. Students can view video lectures recorded and shared by teachers at their own pace, making it an ideal choice for remote and online learning (Heijstra & Sigurðardóttir, 2018; Tuma, 2021; Yoo et al., 2021). YouTube can also be used for tutorials, demonstrations, and sharing instructions, enabling students to learn public speaking techniques, grammatical issues, and new talents. The flipped classroom teaching style, where students watch pre-recorded videos outside of class, complete group projects, problem-solve, and have discussions in class, is supported by YouTube.

Previous research has insufficiently addressed the specific platforms utilized, they merely explored social media in general (Assefa et al., 2023; Lambton-Howard et al., 2021; Mukminin et al., 2023; Noori et al., 2022; Polly et al., 2023). This study will specifically elaborate on YouTube as the chosen social media platform. Furthermore, many prior studies have focused on the perspectives of students and in-service teachers regarding the use of YouTube as a learning tool, neglecting the viewpoint of Pre-Service Teachers. This research will delve into the perceptions of Pre-Service Teachers as a generation expected to become digitally literate educators (Lambton-Howard et al., 2021; Zavyalova & Galvin, 2022).

Previous research by Ogirima et al. (2021) employed a quantitative research methodology, but it only utilized perceived usefulness (PU) and perceived ease of use (PEU) as its research instrument. This study will comprehensively address the impact of facilitating conditions (FC) on perceived usefulness (PU) and perceived ease of use (PEU). Additionally, it will examine the influence of PU and PEU on Attitudes (AT) and behavior intention (BI), as well as the impact of AT on BI. Consequently, the study aims to generate insights into the behavior of Pre-Service Teachers when using YouTube as a learning medium. It is noteworthy that Ogirima et al.'s (2021) research was conducted in Nigeria, whereas this study takes place in Indonesia,

where no similar research has been conducted to date.

The Technology Acceptance Model (TAM) is a theoretical framework used to predict the acceptance and adoption of technology among pre-service teachers, particularly in education. This study aims to improve instructional approaches by examining efficient strategies for integrating YouTube into the educational setting. By investigating the connections among technology utilization variables, teachers can explore creative methods to enhance students' learning outcomes. The study provides insights into pre-service teachers' perceptions of using YouTube as a learning tool and serves as a source for future research.

Methodology

Research Design

This study utilized a quantitative method to investigate pre-service teachers' perceptions of YouTube as a teaching tool for secondary-level students. A questionnaire with closed-ended questions was administered to gather data. The study utilized numerical data and statistical analysis to obtain and analyze the data. Survey studies offer advantages such as obtaining information on large populations with minimal effort and cost-effectiveness. Surveys allow researchers to gather information from a broad range of participants, save time, and provide an economical means of obtaining quantitative data, but careful attention is required when developing well-structured questionnaires.

Sample

This research focuses on pre-service teachers at Universitas Brawijaya and Universitas Negeri Malang, a significant demographic of EFL pre-service teachers known for their impact on younger English learners through technology, particularly YouTube. The study used simple random sampling, with 138 respondents chosen to account for sampling error. The majority of respondents were female, accounting for 73.9% of the sample, while the remaining 36 were male, accounting for 26.1%. The age distribution of the respondents revealed that two respondents were aged 17-19, 133 were aged 20-22, and three were aged 23 or above. The study highlights the importance of understanding the demographic of pre-service teachers in EFL education (See Table 1).

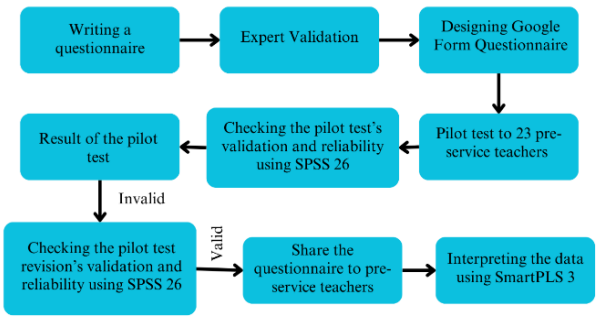
Table 1. Demographic Information (n.138)

Information		V	%
Gender	Male	36	26.1%
	Female	102	73.9%
Age	17-19	2	1.4%
	20-22	133	96.4%
	≥23	3	2.2%
Home University	Universitas Brawijaya	121	87.7%
	Universitas Negeri Malang	17	12.3%
Years in University	Year 4	134	97.1%
	Year 5	4	2.9%

Data Collection and Analysis

The researchers conducted an online survey using Google Forms and shared it within a WhatsApp group. The survey consisted of 15 closed-ended questions about pre-service teachers' perceptions of YouTube in EFL classes. The questionnaire was modified from a previous study by Mukminin et al. (2023). The data was validated and reliability checked using SPSS 26. After eliminating invalid questions, the questionnaire was distributed widely, resulting in 138 responses.

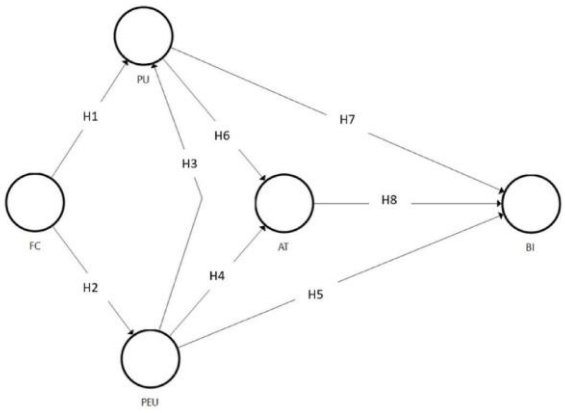
Figure 1. Data Collection and Analysis Procedure



The researchers used SmartPLS 3, a software tool for structural equation modeling (SEM), to analyze the data. They computed path coefficients (β) to gauge the relationships between the elements in the research model, particularly within the Technology Acceptance Model (TAM). T-values and p-values were also calculated to evaluate the statistical significance of the research findings.

The TAM framework provided a solid theoretical foundation for the study, allowing for a deeper understanding of how pre-service teachers perceive and engage with YouTube as an educational tool. The rigorous and data-driven approach of SmartPLS 3 ensured the depth and reliability of the research results. (see Figure 1).

Figure 2. Proposed Model



Results & Discussion

Results

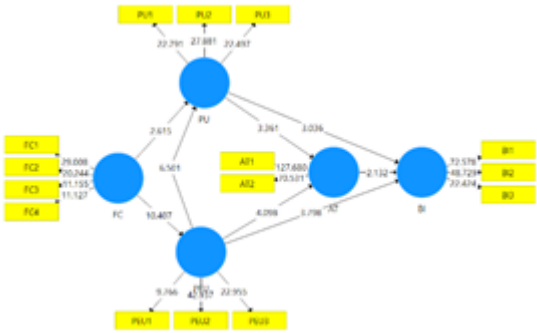
Measurement Model

The study evaluates the validity and reliability of a measurement method using indicator loading, internal consistency reliability (ICR), and convergent and discriminant validity. A criterion for ICR was loading values greater than 0.600, and indicators below this threshold were removed (Hair et al., 2022, p. 77). The study found that 15 indicators remained in the model after ICR assessment. Cronbach's alpha, Rho-A, and composite reliability coefficients were used to calculate ICR and in accordance with Hair et al. (2022, p. 80), who set a criterion that needed values to be greater than 0.600. The alpha values ranging from 0.700 to 0.953, the Rho-A values varied from 0.723 to 0.963, and the composite reliability coefficients ranged from 0.832 to 0.963 (See Table 2 and Figure 3).

Table 2. Loading, Cronbach's Alpha, rho_A, CR, and Average Variance Extracted (AVE)

Construct	Code	Item	Loading	Cronbach's Alpha	rho_A	Composite Reliability	AVE
Attitudes	**AT**	AT1	0.980	0.953	0.963	0.977	0.955
		AT2	0.974				
Behavioural Intention	**BI**	BI1	0.913	0.852	0.880	0.910	0.771
		BI2	0.898				
		BI3	0.820				
Facilitating Conditions	**FC**	FC1	0.847	0.767	0.770	0.853	0.594
		FC2	0.843				
		FC3	0.675				
		FC4	0.701				
Perceived Ease of Use	**PEU**	PEU 1	0.696	0.700	0.723	0.832	0.624
		PEU 2	0.851				
		PEU 3	0.815				
Perceived Usefulness	**PU**	PU1	0.806	0.763	0.764	0.863	0.678
		PU2	0.845				
		PU3	0.819				

Figure 3 Measurement Model



Convergent Validity

Convergent validity, as described by Hair et al. (2022, p. 92) refers to the degree of alignment between a scale and other variables. The study used SmartPLS to calculate the Average Variance Extracted (AVE) to assess convergent validity, which is the degree of alignment between a scale and other variables. The minimum threshold of 0.500 or above signifies an explanation of 50% or greater of the variation. All variables investigated in the study showed AVE scores above the threshold, including AT (0.955), BI (0.771), FC (0.594), PEU (0.624), and PU (0.678).

Discriminant Validity

Discriminant validity refers to the difference between a variable and other variable, and issues can arise when the heterotrait-monotrait ratio of correlations (HTMT) reaches a threshold value of 0.900 (Hair et al., 2022; Henseler et al., 2015). This investigation found that all HTMT values were lower than this threshold, indicating no issues related to convergent validity. A cross-loading study was conducted to evaluate discriminant validity, and the loading values for each variable exceeded their cross-loading on other variables, providing strong evidence for discriminating validity. These loading values were highlighted in italics and bold fonts. This supports the findings from the heterotrait-monotrait

(HTMT) and the findings from the study (See Table 3 and Table 4).

Table 3. HTMT

	AT	BI	FC	PEU
AT				
BI	0.602			
FC	0.501	0.642		
PEU	0.694	0.777	0.744	
PU	0.659	0.758	0.630	0.829

Table 4. Cross Loading

	AT	BI	FC	PEU	PU
AT1	***0.980***	0.577	0.461	0.604	0.576
AT2	***0.974***	0.503	0.392	0.526	0.528
BI1	0.568	***0.913***	0.567	0.647	0.605
BI2	0.490	***0.898***	0.409	0.538	0.538
BI3	0.376	***0.820***	0.412	0.412	0.470
FC1	0.274	0.458	***0.847***	0.488	0.443
FC2	0.244	0.352	***0.843***	0.352	0.283
FC3	0.461	0.387	***0.675***	0.514	0.359
FC4	0.342	0.419	***0.701***	0.371	0.413
PEU1	0.336	0.399	0.286	***0.696***	0.429
PEU2	0.430	0.509	0.540	***0.851***	0.544
PEU3	0.583	0.544	0.500	***0.815***	0.470
PU1	0.537	0.506	0.492	0.533	***0.806***
PU2	0.480	0.477	0.313	0.451	***0.845***
PU3	0.375	0.542	0.413	0.516	***0.819***

Structural Model

The structural model assessment involves analyzing prediction sets for potential collinearity, which problems occur when the measured Variance Inflation Factor (VIF) reaches a threshold value of 3.00 (Hair et al., 2022). However, our analysis using SmartPLS shows that collinearity is not a concern in our research, as all VIF values are below the established threshold. The relationships between variables are as follows: FC to PU (1.495), FC to PEU (1.000), PEU to PU (1.495), PEU to AT (1.593), PU to AT (1.593), PU to BI (1.786), and AT to BI (1.693).

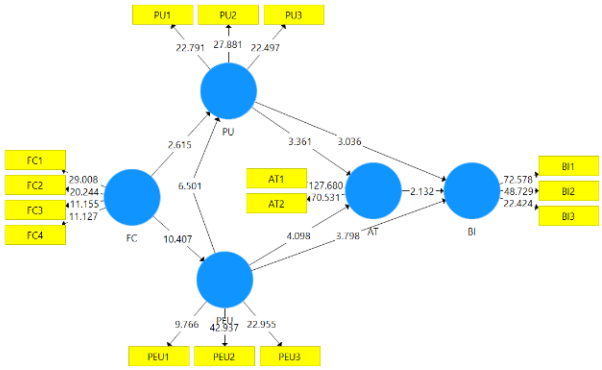
Table 5. Structural Model

H	Coefficient	VIF	β	t value	p-value	Sig.
H1	FC->PU	1.495	0.221	2.615	0.009	Significant
H2	FC->PEU	1.000	0.576	10.407	0.000	Significant
H3	PEU->PU	1.495	0.483	6.501	0.000	Significant
H4	PEU->AT	1.593	0.375	4.098	0.000	Significant
H5	PEU->BI	1.830	0.313	3.798	0.000	Significant
H6	PU->AT	1.593	0.338	3.361	0.001	Significant
H7	PU->BI	1.786	0.318	3.036	0.003	Significant
H8	AT->BI	1.693	0.193	2.132	0.034	Significant

Structural Model Relationship

The study used bootstrapping to test the associations between endogenous and exogenous constructs. The study aimed to determine the coefficients of the route and confirmed all hypotheses using a 5% significance level (See Figure 4 and Table 5). The results showed a significant relationship between perceived ease of use (PEU) and perceived usefulness (PU). The first hypothesis (H1) supported a significant relationship between FC and PU (β = 0.221, t = 2.615, p = .009). In hypothesis H2, the findings of this study provide strong evidence that FC is a significant predictor of PEU (β = 0.576; t = 10.407; p < .001). The hypothesis (H3) suggested that perceived ease of use (PEU) influences perceived usefulness (PU) was similarly supported by the results (β = 0.483; t = 6.501; p < .001). The hypothesis H4 supported the idea that PEU positively affects Behavioral Intention (AT) (β = 0.375, t = 4.098, p < .001). The hypothesis H5 proposed the influence of PEU on BI was subsequently validated (β = 0.313; t = 3.798; p < .001). The validation of H6 further supported the significant impact of PU on the prediction of AT (β = 0.338; t = 3.361; p = .001). The variable PU showed a significant ability to predict BI, supporting hypothesis H7 (β = 0.318; t = 3.036; p = .003). Finally, hypothesis H8 received support due to the significant correlation observed between AT and BI (β = 0.193; t = 2.132; p = .034).

Figure 4. Structural model, t value



Discussion

This study examines the integration of YouTube into teaching methods, focusing on the impact of external and internal factors on pre-service teachers' behavioral intentions. The research identifies facilitating conditions (FC) as an external factor, with positive conditions significantly influencing the perceived usefulness (PU) and ease of use (PEU) of YouTube as a teaching medium for pre-service teachers as demonstrated through the

results of the hypothesis testing for H1 (β = 0.221, t = 2.615, p = .009) and H2 (β = 0.576; t = 10.407; p < .001). This suggests that the presence of positive facilitating conditions plays a crucial role in determining the perceived usefulness and ease of use of YouTube as a teaching medium for pre-service teachers.

This study demonstrates that YouTube can be effectively used by pre-service teachers as a pedagogical tool, provided the facilitating conditions are favorable. These conditions include internet access, instruction on YouTube integration, and access to technological gadgets. When these conditions are favorable, pre-service teachers perceive the system as more user-friendly, highlighting the importance of facilitation in improving its usefulness. The findings align with previous research, with a strong relationship between AT and BI, as found by Buabeng-Andoh et al. (2019) and Sukendro et al. (2020).

The research conducted by Buabeng-Andoh et al. (2019) indicated that the relationship between AT and BI (H1) showed a path coefficient of 0.20, while Sukendro et al. (2020) found a path coefficient of 0.224 in their study. It means that both Sukendro's and Buabeng's research findings have strong relationship between AT and BI. This finding enriches with the results of prior studies conducted by Nikou & Economides (2019); Sukendro et al. (2020); Teo et al. (2019), showing a similar and significant outcome for research H2. The research conducted by Sukendro et al. (2020) showed a significant finding regarding the path coefficient of FC on PEU. A result of 0.608 showed a significant connection between these two indicators, suggesting an effective relationship. However, the study contradicts Rejón-Guardia et al. (2020) findings, showing a weak path coefficient of 0.186 and a p-value of 0.084, indicating that the hypothesis under investigation is not statistically significant, despite the weak path coefficient and p-value in Rejon's study.

Hypothesis H3 produces a significant and strong relationship between PEU and PU (β = 0.483; t = 6.501; p < .001). This finding indicates that the perceived level of ease of use of YouTube has a positive correlation with the perceived usefulness of YouTube. This convenience can be in the form of ease of access to teaching materials, flexibility, and interactivity. The findings of the H3 study enrich the existing research by Buabeng-Andoh et al., (2019); Mukminin et al., (2023); Rejón-Guardia et al., (2020); Sukendro et al., (2020); and Teo et al., (2019). For instance, research conducted by Buabeng-Andoh et al. (2019) found a path coefficient value of 0.523, indicating a strong relationship between the indicators.

The study reveals that perceived ease of use (PEU) and perceived usefulness (PU) significantly influence attitudes (AT) towards technology or platforms like YouTube for teaching secondary-level students. The results of hypothesis testing for H4 and H6 show a strong impact on AT is demonstrated through the results of the hypothesis testing for H4 (β = 0.375; t = 4.098; p < .001) and H6 (β = 0.338; t = 3.036; p = .001), suggesting that pre-service teachers' perception of YouTube's accessibility and benefits significantly impacts their opinions. The acceptance of Hypothesis H4 in this study will enrich previous research, as demonstrated by Buabeng-Andoh et al., 2019; Mukminin et al., 2023; Rejón-Guardia et al., 2020; and Sukendro et al., 2020). An example can be found in a study conducted by Buabeng-Andoh et al. (2019) where a path coefficient value of 0.465 was obtained. In addition to this, the hypothesis H6 can be accepted as Buabeng's research strengthens its findings, indicated by a path coefficient value of 0.288. However, this research contradicts the findings of Sukendro et al. (2020), which have a path coefficient value of 0.077 and a p-value of 0.71, indicating it is not significant.

In H5 and H7, the study investigates the impact of perceived ease of use (PEU) and perceived effectiveness (PU) on behavioral intention (BI) when using YouTube for teaching. The results show a strong impact of PU and PEU on BI through the results of the hypothesis testing for H5 (β = 0.313; t = 3.798; p < .001) and H7 (β = 0.318; t = 3.036; p = .003), suggesting that pre-service teachers who perceive YouTube as easy to use and beneficial are more likely to actively incorporate it into their teaching methods. However, the findings regarding H5 differ from previous research by Rejón-Guardia et al., (2020) and Teo et al., (2019). In a previous study conducted by Rejón-Guardia et al. (2020) has a low path coefficient and T-value (β = 0.149; t = 0.05, which are p-value considered not significant (Hair et al., 2020). Similarly, the path coefficient value for Teo is found to be weak, with an estimated value of 0.13. In addition, it is important to note that the T-value of 1.35 is considered not significant. A t-value is considered significant only if its value is below the threshold of 1.96 (Ghozali, 2016).

Finally, the significant impact of Attitude (AT) on Behavioral Intention (BI) is an important aspect to consider when using YouTube for teaching. This study demonstrates that the correlation between variables is weaker when compared to another hypothesis, although it remains statistically significant. The existence of a positive attitude among pre-service teachers towards integrating YouTube into their teaching significantly impacts their willingness to sustain its usage. The results of the present study weaken the findings of prior

research conducted by Mukminin et al. (2023), where a path coefficient of 0.521 was found to indicate a strong relationship among the variables.

Conclusion

The study aims to enhance pre-service teachers' teaching methods by integrating YouTube into the classroom. It explores the relationship between technology usage, perceived usefulness, ease of use, attitudes, and behavioral intentions. Hypothesis H1 suggests that people perceive technology usefulness when Facilitating Conditions are beneficial, such as access and support. Hypothesis H2 suggests that favorable conditions also provide ease of use. Hypothesis H3 suggests that people view technology favorably, and attitudes and perceived benefits are interconnected. Hypothesis H7 suggests that technology is more likely to generate an intention to use it if perceived as useful. The findings of H8 suggest that an individual's attitude significantly impacts their intention to use a particular technology, specifically Behavioral Intention (BI).

The use of technology by pre-service teachers is crucial for enhancing students' learning experiences. It is essential to consider the facilitating conditions include access to resources, promoting appropriate technology and instructional materials, and ensuring ease of use. The perceived ease of use influences technology adoption. Pre-service teachers should provide technological knowledge in an understandable and applicable manner, improving students' views on technology and fostering enthusiasm for learning. However, the study's limitations include limited participation only from Universitas Brawijaya and Universitas Negeri Malang, Indonesia. Future research should expand the sample to include a diverse range of universities, encompassing different geographic areas and educational settings. This will provide a more inclusive representation of the phenomenon and deeper understanding of pre-service teacher interactions in diverse educational settings.

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