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Factors Influencing the Acceptance of Bring Your Own Device (BYOD) among Primary School Teachers in Malaysia

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Abstract
This study examines the factors influencing Malaysian primary school teachers' acceptance of Bring Your Own Device (BYOD) using Partial Least Squares Structural Equation Modeling (PLS-SEM). Data were collected through a questionnaire survey, and an integrated model combining TAM, UTAUT, and UGT was tested. The results indicate that cognitive need, social need, affective need, perceived usefulness, perceived ease of use, and effort expectancy significantly influence attitudes toward BYOD. In contrast, performance expectancy, social influence, and facilitating conditions were not significant. The findings highlight the importance of targeted professional training, infrastructure, and policy communication to enhance BYOD readiness in primary schools.

Keywords: Bring Your Own Device; Technology Acceptance Model; Unified Theory of Acceptance and Use of Technology; Uses and Gratifications Theory

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1.0 Introduction

As educational systems strive to enhance teaching, learning, and administrative efficiency, the use of digital technology in classrooms has increased worldwide. The Bring Your Own Device (BYOD) initiative is one such strategy that enables teachers and students to use their own digital devices—such as laptops, tablets, and smartphones—for educational purposes. BYOD has gained significant attention for its potential to support personalized learning, expand access to digital resources, and reduce reliance on school-provided hardware. This trend reflects a broader shift toward learner-centered pedagogies, where technology plays a crucial role in shaping engagement and learning interactions.

Malaysia's Ministry of Education (MoE) introduced the BYOD initiative through its 2018 circular, providing guidelines on data security, responsible device use, and supported learning activities (Ministry of Education Malaysia, 2018). Despite this policy support, BYOD adoption in primary schools remains limited due to challenges related to infrastructure, student readiness, and device management.

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Nevertheless, BYOD is viewed as a potential strategy to enhance digital learning preparedness and address resource constraints in Malaysian schools.

Many schools continue to face limitations in technological resources, restricting students' access to digital learning tools. BYOD offers a practical alternative by enabling students to use their own devices, thereby reducing infrastructure and maintenance burdens. Previous studies indicate that BYOD can enhance pedagogical practices and enrich teaching and learning processes; however, its effective implementation depends largely on teachers' acceptance, which influences classroom integration, learning experiences, and adherence to school policies (Zulaiha Ali Othman et al., 2020).

Understanding the factors that shape teachers' acceptance of BYOD is therefore essential for informing policy development, professional training, and school-level implementation strategies, particularly as Malaysia intensifies its focus on digital learning. Accordingly, the aim of this study is to examine Malaysian primary school teachers' acceptance of the Bring Your Own Device (BYOD) initiative through the integration of the Technology Acceptance Model (TAM), the Unified Theory of Acceptance and Use of Technology (UTAUT), and Uses and Gratifications Theory (UGT). Specifically, this study seeks to identify the factors influencing the acceptance of BYOD among teachers in Malaysian primary schools. By integrating constructs from the Technology Acceptance Model (TAM), the Unified Theory of Acceptance and Use of Technology (UTAUT), and Uses and Gratifications Theory (UGT), this study examines the determinants of BYOD acceptance among Malaysian primary school teachers. The findings are expected to guide policymakers and school leaders in establishing effective frameworks for implementing BYOD in Malaysian primary schools.

2.0 Literature Review

The 21st century has witnessed significant advancements in information and communication technology (ICT), which have transformed classroom practices, school administration, and learning processes. With the increased availability of mobile devices, smartphones, tablets, and laptops have become primary tools used by teachers and students for digital learning and internet access. Malaysia is well positioned for mobile-supported learning environments, as reflected in its high rates of internet usage and mobile device ownership. Although many teachers still struggle to integrate 21st-century skills into their daily teaching practices, studies also indicate an overall rise in digital literacy among Malaysian teachers and students (Nayan et al., 2025).

Bring Your Own Device (BYOD) is a relatively new initiative in Malaysian schools, offering cost efficiency and personalised learning by allowing students to use their own devices. However, its effective implementation depends largely on teachers' pedagogical readiness and digital competence, as infrastructure alone is insufficient (Jalil & Mohamad, 2024). Technology acceptance models such as TAM and UTAUT emphasise the roles of perceived usefulness, perceived ease of use, social influence, and facilitating conditions in shaping teachers' acceptance of technology (Omar & Hashim, 2021). Extending these models, Uses and Gratifications Theory (UGT) highlights the importance of cognitive, affective, and social needs in influencing motivation for technology use (Meiranto et al., 2024).

In educational technology research, TAM (Davis, 1989) has been widely applied to explain ICT and BYOD acceptance, with perceived usefulness and perceived ease of use consistently influencing attitudes and behavioural intentions among teachers (Kim & Lee, 2023; Masilo et al., 2021). Complementing TAM, UTAUT highlights the roles of performance expectancy, effort expectancy, social influence, and facilitating conditions in shaping technology acceptance (Venkatesh et al., 2003). Extending these perspectives, UGT addresses users' psychological motivations, with both earlier and recent studies demonstrating that cognitive, affective, and social needs significantly influence teachers' and future teachers' intentions to adopt mobile and BYOD-related technologies (Hashim et al., 2015; Thongsri et al., 2018; Kuo et al., 2023; Srivastava & Bhati, 2024).

Research on educational technology acceptance suggests that effective integration involves more than simply providing devices; it also requires professional development, teacher training, and strong school-level support (Aldiabat et al., 2024). Studies have shown that teachers' readiness, digital competence, and understanding of school policies influence the success of implementation (Rosli et al., 2022; Othman, 2020), and that perceived usefulness and compatibility strongly predict BYOD acceptance (Siyam, Hussain, & Alqaryouti, 2022). Challenges such as inadequate infrastructure, limited support, and inconsistent training remain particularly pronounced in rural schools (Wang, 2013; Rousey, 2020).

To promote digital learning and improve ICT integration, the Ministry of Education (MoE) has introduced several initiatives, including the Malaysia Education Blueprint 2013–2025, BYOD guidelines (2018), the KGDL initiative, and the DELIMa portal. However, research indicates that despite these substantial investments, ICT usage in schools remains uneven due to persistent gaps in teacher preparedness, infrastructure quality, and policy clarity (Puteh, 2024; Zainal & Zainuddin, 2020).

Overall, existing research shows that successful BYOD implementation in Malaysian schools requires a comprehensive approach that integrates teacher competency, policy support, technological readiness, and alignment with users' motivational needs. By combining constructs from TAM, UTAUT, and UGT, a more holistic framework for examining factors influencing primary school teachers' acceptance of BYOD can be established.

3.0 Methodology

The study investigated the Bring Your Own Device (BYOD) concept and its acceptance among teachers in Malaysian government primary schools teaching in regular classrooms. A mixed data collection approach was adopted, involving both hardcopy and online questionnaires. A total of 500 printed questionnaires were distributed to selected primary schools, and an online version was simultaneously circulated through the State Education Department's official channels. Overall, 468 responses were received; after removing incomplete responses, straight-lining patterns, and inconsistencies, 400 valid samples remained. This study focuses on

primary school teachers due to their role in educating young learners, allowing an assessment of BYOD readiness at the primary level. Although the Ministry of Education's 2018 BYOD circular applies to both primary and secondary schools, implementation has been more widespread in secondary schools. Examining primary school teachers' acceptance therefore provides valuable insights into the feasibility of BYOD for improving digital access and reducing ICT infrastructure costs (Ministry of Education Malaysia, 2018; Othman et al., 2020).

The sample size was determined using the Krejcie and Morgan (1970) table, which recommends a minimum of 384 respondents for large populations, consistent with the approach adopted by Mohd Noor et al. (2021) and supported by Comrey and Lee's (1992) guideline that a sample size of 300 is adequate for quantitative analysis. A stratified random sampling technique was applied across four categories of government primary schools: Sekolah Kebangsaan (SK), Sekolah Jenis Kebangsaan Cina (SJKC), Sekolah Jenis Kebangsaan Tamil (SJKT), and Sekolah Agama Bantuan Kerajaan (SABK), to ensure balanced representation and minimise sampling bias, thereby enhancing the generalisability of the findings (Nayan et al., 2025).

Data were collected using a structured instrument consisting of 54 items derived from the Technology Acceptance Model (TAM) (Davis, 1989), the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003), and Uses and Gratifications Theory (UGT) (Katz et al., 1974). The questionnaire included demographic items and constructs such as affective, cognitive, and social needs; perceived usefulness; perceived ease of use; performance expectancy; effort expectancy; social influence; facilitating conditions; attitude; behavioural intention; and intention. All items were assessed using a six-point Likert scale to capture clear levels of agreement or disagreement.

Data analysis was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4, which is well suited for predictive analysis, complex models, and non-normal data distributions (Hair et al., 2019). The measurement model was examined for reliability and validity, and the structural model was evaluated using 500 bootstrapping samples to determine path significance. The final sample comprised 400 teachers, the majority of whom were female (79.5%). The sample also reflected diverse representation across school types and age groups, providing a strong foundation for examining BYOD acceptance in the Malaysian primary school context.

4.0 Findings

The study involved 400 primary school teachers across Malaysia. In terms of school type, 24.8% were from Sekolah Kebangsaan (SK), 27.2% from Sekolah Jenis Kebangsaan Cina (SJKC), 25.8% from Sekolah Jenis Kebangsaan Tamil (SJKT), and 22.2% from Sekolah Agama Bantuan Kerajaan (SABK). Most respondents were general academic teachers (87.2%), followed by senior assistants (9.5%) and a small number of headmasters (3.3%). The gender distribution shows that the sample was predominantly female (79.5%), with 20.5% male teachers participating in the survey. In terms of age, the largest group consisted of teachers aged 40–49 years (37.5%), followed by those aged 30–39 years (29.8%). Smaller proportions were aged 25–29 years (9.5%), below 25 years (4.8%), and 50–59 years (18.5%), while no respondents were aged 60 and above. With regard to policy knowledge, 48.3% of respondents reported that they "knew and understood" the BYOD circular, 43.5% indicated that they "knew" about it, and 8.3% stated that they "did not know" the policy. Acceptance of the BYOD initiative (excluding smartphones) was relatively balanced, with 46.0% agreeing with the Ministry's suggestion and 54.0% not agreeing. However, support for allowing smartphones in schools was considerably lower, with only 24.0% agreeing and 76.0% disagreeing with the proposal.

4.1 Assessment of the Measurement Model

The measurement model was evaluated to assess indicator reliability, internal consistency, convergent validity, and discriminant validity based on standard PLS-SEM criteria. The results indicate that the reflective measurement model achieved satisfactory levels of reliability and validity. Most indicators recorded outer loadings above the recommended threshold of 0.708 (Hair et al., 2019), indicating strong indicator reliability, except for item CN2 (Cognitive Need), which had a low loading of 0.576 and was removed to improve construct reliability. Internal consistency was confirmed, as all Composite Reliability (CR) values fell within the acceptable range of 0.70 to 0.90, and all Cronbach's Alpha values exceeded 0.70, demonstrating stable reliability across constructs. Convergent validity was established, with all Average Variance Extracted (AVE) values exceeding 0.50, showing that each construct explained more than half of the variance in its respective indicators. Discriminant validity, assessed using the Heterotrait–Monotrait Ratio (HTMT), initially revealed some concerns. Items showing cross-loadings greater than 0.10 were removed to refine the model. After refinement, all HTMT values were below the conservative threshold of 0.85, and the bias-corrected confidence intervals did not include 1, confirming clear distinctions between the constructs. Overall, the measurement model demonstrated strong psychometric properties following item purification, and all retained constructs were deemed reliable and valid for subsequent structural analysis.

Table 1. Reflective measurements model results

Latent Variable	Indicator	Outer Loading	Composite Reliability (CR)	Cronbach's Alpha	Average Variance Extracted (AVE)	Mean	Std. Deviation
Affective Need (AN)	AN1	0.961	0.967	0.967	0.909	3.90	1.360
	AN2	0.954				3.78	1.336
	AN3	0.939				4.04	1.382
	AN4	0.960				3.84	1.365
Attitude (AT)	AT1	0.945	0.980	0.980	0.909	3.63	1.475
	AT2	0.965				3.78	1.406
	AT3	0.958				3.74	1.426
	AT4	0.966				3.70	1.416

	AT5	0.966				3.82	1.438
	AT6	0.921				3.97	1.368
Behavioural Intention (BI)	BI1	0.964	0.981	0.981	0.946	3.41	1.463
	BI2	0.974				3.49	1.485
	BI3	0.977				3.45	1.477
	BI4	0.977				3.53	1.502
Cognitive Need (CN)	CN1	0.960	0.942	0.891	0.774	4.01	1.449
	CN3	0.962				4.01	1.432
	CN4	0.958				3.98	1.423
Effort Expectancy (EE)	EE1	0.949	0.957	0.956	0.884	3.71	1.343
	EE2	0.957				3.75	1.360
	EE3	0.904				3.70	1.410
	EE4	0.949				3.74	1.365
Facilitating Condition (FC)	FC1	0.942	0.962	0.961	0.895	4.26	1.474
	FC2	0.941				4.08	1.501
	FC3	0.963				4.03	1.565
	FC4	0.937				4.07	1.518
Intention (INT)	INT1	0.976	0.986	0.986	0.960	3.63	1.493
	INT2	0.980				3.59	1.465
	INT3	0.981				3.57	1.473
	INT4	0.981				3.59	1.472
Performance Expectancy (PE)	PE1	0.972	0.978	0.978	0.937	3.79	1.406
	PE2	0.965				3.79	1.368
	PE3	0.973				3.82	1.378
	PE4	0.963				3.79	1.375
Perceived Ease of Use (PEU)	PEU1	0.949	0.982	0.982	0.916	3.72	1.366
	PEU2	0.966				3.81	1.380
	PEU3	0.963				3.82	1.347
	PEU4	0.963				3.77	1.362
	PEU5	0.956				3.72	1.351
	PEU6	0.946				3.71	1.403
Perceived Usefulness (PU)	PU1	0.956	0.976	0.975	0.909	3.72	1.492
	PU2	0.928				3.43	1.441
	PU3	0.965				3.80	1.488
	PU4	0.953				3.82	1.475
	PU5	0.964				3.87	1.472
Social Influence (SI)	SI1	0.928	0.971	0.971	0.895	3.63	1.333
	SI2	0.954				3.49	1.336
	SI3	0.959				3.55	1.374
	SI4	0.956				3.49	1.345
	SI5	0.933				3.69	1.414
Social Need (SN)	SN1	0.960	0.976	0.976	0.933	3.76	1.307
	SN2	0.970				3.78	1.367
	SN3	0.968				3.81	1.356
	SN4	0.966				3.80	1.366

Table 2. Discriminant validity heterotrait-monotrait ratio (HTMT)

Constructs	AN	AT	BI	CN	EE	FC	INT	PE	PEU	PU	SI	SN
AN												
AT	0.918											
BI	0.854	0.933										
CN	0.936	0.930	0.861									
EE	0.905	0.921	0.869	0.904								
FC	0.875	0.835	0.764	0.873	0.819							
INT	0.865	0.944	0.955	0.873	0.893	0.779						
PE	0.888	0.908	0.858	0.891	0.966	0.785	0.885					
PEU	0.856	0.896	0.853	0.861	0.943	0.755	0.887	0.968				
PU	0.827	0.864	0.817	0.811	0.902	0.716	0.843	0.916	0.941			
SI	0.853	0.837	0.799	0.872	0.852	0.801	0.804	0.840	0.804	0.781		
SN	0.966	0.930	0.879	0.938	0.913	0.869	0.886	0.894	0.867	0.823	0.847	

4.2 Assessment of the Structural Model

The evaluation of the structural model revealed several key relationships explaining teachers' acceptance of BYOD. Attitude (AT) was found to be the strongest predictor of behavioural intention (BI), demonstrating a highly significant effect ($\beta = 0.915$, $t = 78.534$, $p < 0.001$). Behavioural intention, in turn, significantly predicted intention (INT) to adopt BYOD ($\beta = 0.939$, $t = 103.220$, $p < 0.001$). Several constructs significantly influenced the development of attitude. Social need (SN) was the strongest predictor ($\beta = 0.282$, $t = 3.672$, $p < 0.001$), followed by cognitive need (CN) ($\beta = 0.178$, $t = 3.267$, $p = 0.001$), indicating that teachers are more inclined to favour BYOD

when it meets their social and cognitive needs. Effort expectancy (EE), perceived usefulness (PU), and perceived ease of use (PEU) also demonstrated statistically significant positive effects on attitude. Affective need (AN) showed marginal significance (β = 0.086, p = 0.096), suggesting partial support for its role in shaping attitude. In contrast, social influence (SI), performance expectancy (PE), and facilitating conditions (FC) were not significant predictors, indicating that these factors may be less influential in shaping attitudes toward BYOD in primary school settings. Overall, the results highlight the central roles of behavioural intention and attitude in determining primary school teachers' acceptance of BYOD.

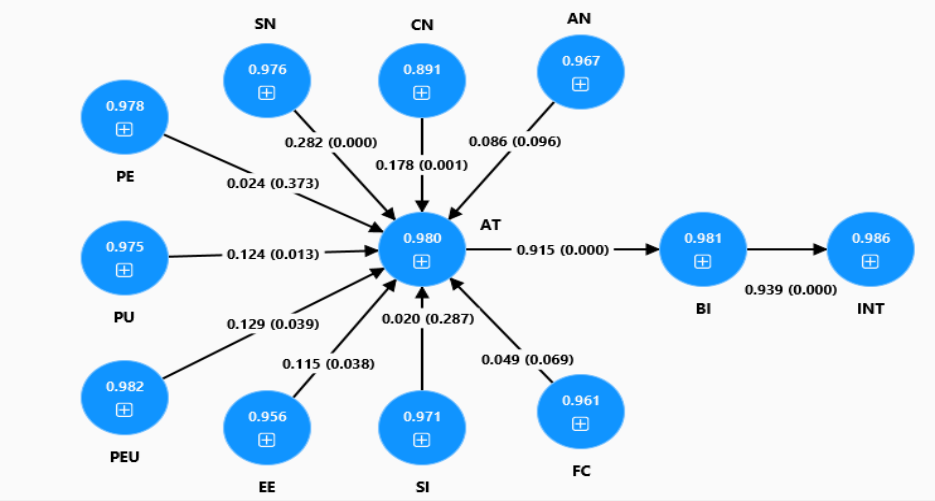

Fig. 1: Hypotheses Testng Results for the Structural Model

Table 3. Path Coefficient an Hypotheses Testing Results for the Structural Model

Hypotheses	Path	ß (Path Coefficient)	t-value	p-value	Result
H1	AN -> AT	0.086	1.305	0.096	Accepted
H2	AT -> BI	0.915	78.534	0.000	Accepted
H3	BI -> INT	0.939	103.220	0.000	Accepted
H4	CN -> AT	0.178	3.267	0.001	Accepted
H5	EE -> AT	0.115	1.770	0.038	Accepted
H6	FC -> AT	0.049	1.481	0.069	Accepted
H7	PE -> AT	0.024	0.324	0.373	Rejected
H8	PEU -> AT	0.129	1.757	0.039	Accepted
H9	PU -> AT	0.124	2.218	0.013	Accepted
H10	SI -> AT	0.020	0.562	0.287	Rejected
H11	SN -> AT	0.282	3.672	0.000	Accepted

5.0 Discussion

The results of this study provide important insights into the factors influencing Malaysian primary school teachers' acceptance of BYOD. Consistent with the Technology Acceptance Model (TAM), attitude emerged as the strongest predictor of behavioural intention, which subsequently had a substantial effect on teachers' intentions to use BYOD. This supports earlier research highlighting the central role of attitudinal evaluation in decisions related to technology adoption (Davis, 1989; Omar & Hashim, 2021). Teachers who perceive BYOD as beneficial are more likely to endorse its implementation, as demonstrated by the significant influence of behavioural intention on actual intention, further reinforcing the predictive power of TAM and UTAUT (Venkatesh et al., 2003).

Intrinsic motivation was also found to be an important driver of technology adoption, consistent with previous studies (Hashim, Tan & Rashid, 2015; Meiranto et al., 2024). Among the motivational factors derived from Uses and Gratifications Theory (UGT), both social need and cognitive need significantly predicted attitude. This indicates that teachers perceive BYOD not only as a practical tool but also as a platform that supports social interaction and knowledge acquisition in the classroom. The marginal effect of affective need suggests that emotional satisfaction alone may not play a major role in shaping attitudes toward BYOD in primary school contexts.

The significant effects of perceived usefulness, perceived ease of use, and effort expectancy further support the propositions of TAM and UTAUT, affirming that teacher acceptance is strongly influenced by practical utility and ease of implementation (Siyam, Hussain & Alqaryouti, 2022). In contrast, performance expectancy, social influence, and facilitating conditions were not found to be significant predictors. This may be attributed to the relatively limited acceptance of BYOD in primary schools, where peer influence, institutional support systems, and technological infrastructure are still developing (Puteh, 2024). Although the MoE's 2018 BYOD circular permits implementation in both primary and secondary schools, actual adoption remains more prevalent in secondary settings, potentially reducing the perceived relevance of these variables. Overall, the findings indicate that successful integration of BYOD in primary schools

requires a focus on enhancing system usability, demonstrating educational value, and addressing teachers' cognitive and social motivations. Strengthening these elements is essential to promote positive attitudes and encourage widespread adoption of BYOD among primary school teachers.

6.0 Conclusion & Recommendations

By integrating concepts from TAM, UTAUT, and UGT, this study examined the key factors influencing Malaysian primary school teachers' acceptance of the Bring Your Own Device (BYOD) initiative. The findings reveal that attitude and behavioural intention are the strongest predictors of BYOD acceptance, underscoring the importance of teachers' positive perceptions of the technology. Teachers adopt BYOD not only for its instructional benefits but also for its capacity to enhance engagement and collaborative learning, as reflected in the significant contributions of cognitive and social needs. The significant effects of perceived usefulness, perceived ease of use, and effort expectancy further indicate the need for systems that are functional, user-friendly, and supportive of teachers' daily work processes.The key constraints of this study lies in the large and geographically dispersed population of Malaysian government primary school teachers across Peninsular Malaysia, Sabah, and Sarawak, where data collection is often constrained by accessibility, geographic boundaries, and feasible recruitment channels, and in the focus on teachers teaching in mainstream classrooms only, which may limit the generalisability and contextual breadth of the findings.

Several recommendations emerge from these findings. First, to ensure effective BYOD integration, school administrators and the Ministry of Education should provide structured professional development focusing on both pedagogical strategies and classroom management in BYOD settings. Second, schools should strengthen technical support systems and digital infrastructure to enhance usability and reduce implementation barriers. Third, awareness and training programmes should be aligned with the MoE's 2018 BYOD circular to ensure that teachers fully understand policy requirements and safety guidelines. Future research may explore students' readiness, parental acceptance, and differences in BYOD implementation across school types to develop a more comprehensive understanding of BYOD acceptance in primary education.

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Paper Contribution to Related Field of Study

This paper contributes to the field by providing insights into the role of professional development, collaboration, and policy support in implementing BYOD in school settings. The findings also inform policymakers, school administrators, and teachers about the potential of BYOD as an alternative approach to technology integration in public schools.

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