

Pragmatic Adoption of Blended Project-Based Learning Among Indonesian Language Teachers: The Role of Motivation and Educational Environment

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Abstract—This study investigated the pragmatic orientation of senior high school Indonesian language teachers in adopting blended project-based learning, with particular attention to the roles of motivation and the educational environment. The study examined the determinants of teachers' adoption intention by extending the Technology Acceptance Model (TAM) through the inclusion of Blended Learning Motivation (BLM) and the Educational Environment (EE). A quantitative cross-sectional survey was conducted with 148 Indonesian-language teachers, and the data were analyzed using Structural Equation Modeling (SEM) in AMOS. The measurement model demonstrated strong construct validity and reliability, and the structural model exhibited satisfactory goodness-of-fit indices. The results revealed a notable divergence from classical TAM assumptions. Perceived Usefulness (PU) exerted a significant direct effect on Intention to Adopt (INT) but did not significantly influence Attitude (ATT). In contrast, attitude was primarily shaped by Perceived Ease of Use (PEU) and Blended Learning Motivation. Furthermore, the Educational Environment functioned as an indirect antecedent, significantly predicting motivation, while exerting no direct effect on adoption intention. These findings indicate a pattern of pragmatic adoption, in which teachers' technology adoption decisions are driven primarily by professional utility and usability considerations rather than affective preferences. From a practical perspective, the findings suggest that policy interventions should prioritize technical simplicity to foster positive attitudes and strengthen infrastructural and institutional support to sustain teachers' motivation to adopt blended, project-based learning.

Index Terms—blended project-based learning, educational environment, language teachers, motivation, teacher pragmatism

I. INTRODUCTION

Education in the twenty-first century faces significant challenges in preparing students for an increasingly digital and technology-driven world. These challenges require instructional approaches that foster not only content mastery but also adaptability, collaboration, and higher-order thinking skills. One approach that has gained growing attention is blended project-based learning, which combines project-based learning with both online and face-to-face instructional modes (Tong et al., 2020). This approach offers instructional flexibility and enables students to collaborate more effectively, engage in critical thinking, and develop competencies relevant to an evolving industrial landscape (Batista-Toledo & Gavilan, 2022). Despite these pedagogical benefits, including improvements in digital literacy and problem-solving skills, implementing blended project-based learning in classrooms remains challenging. These challenges are particularly evident in developing economies, where structural and contextual constraints continue to limit effective adoption (Al-Kamzari & Alias, 2025; Zhangli et al., 2024).

Within policy environments that increasingly emphasize technology integration, teachers play a pivotal role in determining whether innovative instructional approaches are implemented meaningfully or remain merely symbolic (Machumu & Zhu, 2019). Teachers act as the primary mediators between educational policy and classroom practice,

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translating policy directives into concrete pedagogical actions (Chen et al., 2025). Consequently, the adoption of blended project-based learning largely depends on teachers' attitudes and their intentions to implement this approach in their teaching practices (McAllister et al., 2012; Nagaraja & Davidson, 2024). However, technology adoption in educational settings is more complex than in consumer technology contexts, where use is typically voluntary. In many educational systems, particularly those characterized by centralized governance, technology integration becomes a professional obligation shaped by policy mandates, institutional expectations, and working conditions (Gong et al., 2025).

Although research on educational technology adoption has expanded considerably, several limitations remain. One major gap lies in the dominance of higher education contexts in existing studies, despite the different conditions teachers face in senior high schools. Compared with higher education settings, senior high school teachers often operate under stricter curricular control, limited infrastructure, and reduced pedagogical autonomy (Anwar et al., 2022; Luo, 2025). These differences limit the transferability of findings from higher education to senior high school contexts, particularly in developing countries. Another limitation concerns the theoretical framing of technology adoption. The Technology Acceptance Model (TAM) has been widely used. However, its strong emphasis on cognitive-instrumental beliefs—such as Perceived Usefulness (PU) and Perceived Ease of Use (PEU)—has been criticized for oversimplifying the adoption process (Al-Abdullatif & Gameil, 2021; Porkodi & Tabash, 2024; Yu et al., 2023). As a result, broader contextual conditions and intrinsic psychological factors, including the Educational Environment (EE) and teachers' Motivation, are often treated as peripheral rather than central determinants of adoption.

These limitations are particularly evident in Global South contexts such as Indonesia, where persistent digital divides, uneven infrastructure, and institutional constraints continue to shape everyday teaching practices (Dewanda et al., 2025; Habibi et al., 2021; Sapiyah et al., 2025). In such environments, the Educational Environment does not merely influence technology adoption indirectly but actively shapes what forms of adoption are feasible and sustainable (Erlina et al., 2025; Yuniarty et al., 2024). However, empirical studies that integrate environmental conditions and teachers' motivational dynamics within a unified technology adoption framework remain limited, particularly at the senior high school level (Norman et al., 2025; Tiwow et al., 2025). Moreover, existing research has given limited attention to the possibility that teachers adopt technology not primarily because of positive attitudes but due to pragmatic professional considerations shaped by contextual demands (Habibi et al., 2021; Koessoy et al., 2025).

To address these gaps, the present study extends the Technology Acceptance Model by incorporating Blended Learning Motivation and the Educational Environment as central explanatory variables. This extension is applied to examine the adoption of blended project-based learning among senior high school Indonesian language teachers. Rather than assuming a linear "Belief–Attitude–Intention" process, this study conceptualizes technology adoption as a context-sensitive and pragmatic decision-making process. This process reflects the interaction between teachers' motivational forces and the constraints imposed by their educational environment. By focusing on Indonesian language teachers in senior high schools, this study seeks to explain how technology adoption unfolds within a mandatory educational context characterized by limited pedagogical flexibility and strong institutional influence. The study investigates how environmental conditions and teachers' motivational orientations jointly shape their intentions to adopt blended project-based learning. It also examines whether adoption is driven primarily by affective attitudes or by professional pragmatism related to perceived usability. Through this perspective, the study introduces the concept of Teacher Pragmatism as a theoretical lens for understanding educational technology adoption in developing country contexts.

II. LITERATURE REVIEW

A. *Blended-Project-Based Learning as a Pedagogical Disruption*

Blended-Project-Based Learning (BPBL) represents the pedagogical convergence of blended learning and project-based learning, combining flexible digital delivery with inquiry-driven, student-centered project work (Alamri, 2021; Chua & Islam, 2021). While project-based learning foregrounds collaboration, authentic problem solving, and the production of meaningful learning artifacts, blended learning has expanded these pedagogical processes. This expansion has occurred through multimodal learning environments that enabled asynchronous interaction, online scaffolding, and extended access to learning resources (Guo et al., 2023; Rahmawati et al., 2020). In language education contexts, this integration has allowed communicative practice to transcend physical classroom boundaries through technology-mediated collaboration and project-based language tasks, thereby supporting more authentic and sustained language use (Albatti, 2023; Garib, 2023; Jiang, 2022).

Despite its strong pedagogical promise, BPBL also constituted a form of pedagogical disruption, particularly for teachers accustomed to conventional, teacher-centered instructional models. Implementing BPBL required educators to orchestrate learning across face-to-face and digital environments, manage collaborative project workflows, and provide continuous formative feedback. These combined responsibilities substantially increased instructional complexity and cognitive demands (Ali, 2025; Hong et al., 2025; Meng et al., 2023). Empirical studies have demonstrated that such dual-mode instructional responsibilities heightened teachers' cognitive load and workload, especially when institutional support and technological readiness were insufficient (Cheng, 2019; Oluwajana et al., 2023).

Consequently, teachers' acceptance of blended-project-based learning was shaped not only by perceptions of

pedagogical effectiveness but also by cognitive evaluations, motivational readiness, and broader educational conditions. Factors such as perceived workload, digital competence, availability of instructional support, and alignment with existing curricular demands played a critical role in shaping teachers' willingness to adopt BPBL practices (Alamri, 2021). These interrelated assumptions underpinned the conceptual framework proposed in this study, as illustrated in Figure 1.

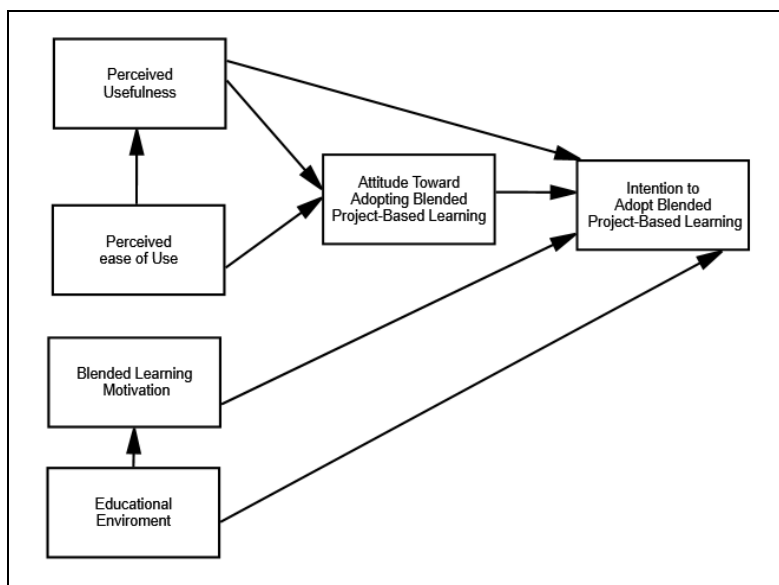


Figure 1. Extended TAM Conceptual Framework

B. Technology Acceptance Model for Educational Contexts

The Technology Acceptance Model (TAM) posits that technology adoption is primarily driven by Perceived Usefulness (PU) and Perceived Ease of Use (PEU), which influence users' Attitude (ATT) and, in turn, shape their Behavioral Intention (INT) (Davis, 1989). While TAM has demonstrated strong explanatory power across various domains, its minimalist structure has been widely criticized for failing to adequately capture the complexity of educational settings. Empirical evidence suggests that technology adoption in education is deeply embedded in institutional constraints, pedagogical beliefs, social expectations, and motivational dynamics that the original TAM framework did not sufficiently address (Granić, 2022; Scherer et al., 2019). In school contexts, teachers' technology use was further shaped by their conceptions of teaching and learning, underscoring the need for contextually grounded and pedagogically informed extensions of TAM (Al-Abdullatif & Gameil, 2021; Teo & Zhou, 2017; Yu et al., 2023).

Classical TAM assumes that technology use is largely voluntary. In school environments, however, teachers' adoption decisions have frequently been influenced by external pressures, including curriculum mandates, institutional support, leadership expectations, and peer norms. Prior studies have shown that environmental affordances and organizational conditions played a critical role in shaping technology-related behaviors in educational institutions (Nikou & Economides, 2019; Zhao & Frank, 2003). To address these limitations, the present study extends TAM by integrating constructs informed by Social Cognitive Theory, with particular attention to the role of environmental affordances. It also draws on Self-Determination Theory, which emphasizes motivation as a key driver of behavior in educational technology adoption (Al-Dokhny et al., 2021; Ly et al., 2024). As illustrated in Figure 1, Educational Environment (EE) and Blended Learning Motivation (BLM) are incorporated as exogenous variables that complement TAM's cognitive belief structure. This integration results in a more ecologically valid and motivationally grounded model for understanding teachers' adoption of blended project-based learning (Cheng, 2019).

C. The Ecological Foundation: Educational Environment

Educational Environment (EE) refers to the broader ecosystem in which teachers operate (Ustin et al., 2021). This ecosystem encompasses physical infrastructure, such as internet connectivity and digital devices, institutional policies, professional development opportunities, and collegial support (Munasi, 2025). Empirical studies have consistently demonstrated that the availability of technological resources and organizational support played a critical role in shaping teachers' readiness to integrate blended learning into their instructional practices (Antwi-Boampong, 2020; Dahri et al., 2024). Within this perspective, EE was conceptualized not merely as a technical setting but as an institutional context that conditioned how teachers perceived the feasibility and value of pedagogical innovation.

Drawing on Herzberg's Two-Factor Theory, environmental conditions within EE were understood as "hygiene factors" that did not necessarily motivate teachers in themselves but generated dissatisfaction and resistance when absent (Ibrahim & Nat, 2019). Conversely, when adequate infrastructure, clear policies, and institutional backing were present, these conditions reduced structural barriers and facilitated professional engagement (Al-Abdullatif & Gameil,

2021). As illustrated in Figure 1, EE was conceptualized as an upstream factor that shaped teachers' technology adoption both directly and indirectly by strengthening Blended Learning Motivation (BLM). When teachers perceived their schools as providing sufficient resources and policy support, they were more likely to develop favorable attitudes toward blended project-based learning. This perception also strengthened their intentions to adopt the approach in practice (Antwi-Boampong, 2022; Li & Zhu, 2023). Accordingly, the following hypotheses are proposed:

H2: Educational Environment (EE) has a significant positive effect on Blended Learning Motivation (BLM).

H6: Educational Environment (EE) has a significant positive effect on Attitude (ATT).

H7: Educational Environment (EE) has a significant positive effect on Intention to Adopt (INT).

D. The Psychological Driver: Blended Learning Motivation

Motivation represents an internal force that energizes, directs, and sustains behavior. In the present study, Blended Learning Motivation (BLM) encompasses both intrinsic motivation, including enjoyment, curiosity, and pedagogical interest, and extrinsic motivation, such as professional recognition and career advancement, related to the use of blended instructional approaches (Marcellis et al., 2024; Yong & Tiong, 2022). Although TAM emphasizes cognitive appraisals of technology, it has largely overlooked users' motivational states (Gómez et al., 2020).

As illustrated in Figure 1, BLM was positioned as a psychological antecedent of both attitude and Intention. Teachers who were strongly motivated were more likely to tolerate technical challenges and to perceive blended, project-based learning more positively, thereby developing favorable attitudes (Dahri et al., 2024; Ibrahim & Nat, 2019). Moreover, strong motivation was found to translate directly into adoption intention, even in the absence of a fully formed affective evaluation (Alamri, 2021). Based on this rationale, the following hypotheses are advanced:

H5: Blended Learning Motivation (BLM) has a significant positive effect on Attitude (ATT).

H8: Blended Learning Motivation (BLM) has a significant positive effect on Intention to Adopt (INT).

E. Cognitive Beliefs: The Interplay of Ease and Usefulness

Extensive empirical research grounded in the Technology Acceptance Model has consistently demonstrated that cognitive beliefs constitute a central mechanism in shaping technology adoption decisions. Perceived Ease of Use (PEU) is defined as the degree to which teachers believe that blended project-based learning systems are free of effort. As illustrated in Figure 1, PEU was hypothesized to influence both Perceived Usefulness (PU) and Attitude (ATT), reflecting TAM's core assumption that ease of use simultaneously shapes instrumental and affective evaluations (Antwi-Boampong, 2022; Ibrahim & Nat, 2019). When digital platforms and learning management systems were perceived as intuitive and user-friendly, teachers could allocate more cognitive resources to instructional design and pedagogical decision-making. As a result, perceptions of instructional effectiveness and usefulness were strengthened (Gómez et al., 2020; Porkodi & Tabash, 2024).

Conversely, complex or unintuitive systems increased cognitive load and triggered technostress and anxiety, which, in turn, elicited negative affective responses toward technology use (Chou & Chou, 2021; Panisoara et al., 2021). Empirical evidence indicates that such technostress undermines positive attitudes toward digital pedagogy and weakens teachers' willingness to engage with blended learning environments (Gabbiadini et al., 2023). Accordingly, PEU played a dual role by shaping both instrumental beliefs (PU) and emotional evaluations (ATT). Based on this logic, the following hypotheses are formulated:

H1: Perceived Ease of Use (PEU) has a significant positive effect on Perceived Usefulness (PU).

H4: Perceived Ease of Use (PEU) has a significant positive effect on Attitude (ATT).

F. Core TAM Relationships and Pragmatic Adoption

The relationship among Perceived Usefulness (PU), Attitude (ATT), and Intention (INT) constitutes the core structure of the Technology Acceptance Model (TAM). The traditional causal pathway, $PU \rightarrow ATT \rightarrow INT$, posits that teachers who perceived blended project-based learning as beneficial for improving instructional effectiveness were more likely to develop positive attitudes toward its use. These positive attitudes subsequently fostered stronger intentions to adopt the approach (Davis, 1989; Viswanath & Davis, 2000). This affective mediation mechanism has been consistently validated in educational technology research, indicating that attitude served as a key psychological conduit through which perceived utility translated into adoption intention (Teo, 2011). This indirect pathway is explicitly represented in Figure 1.

H3: Perceived Usefulness (PU) has a significant positive effect on Attitude (ATT).

H10: Attitude (ATT) has a significant positive effect on Intention to Adopt (INT).

However, extensions of TAM, such as TAM2 and UTAUT, have suggested that in professional or semi-mandatory contexts, behavioral intentions were often formed directly from perceived utility, bypassing the attitudinal stage (Machumu & Zhu, 2019; Viswanath & Davis, 2000). In institutional settings shaped by performance expectations or organizational norms, teachers may have intended to adopt blended project-based learning primarily for its instructional efficiency or institutional alignment, rather than affective preference (Venkatesh et al., 2003). To capture this pragmatic orientation toward technology use, a direct path from Perceived Usefulness to Intention was incorporated and empirically tested in the proposed model, as illustrated in Figure 1.

H9: Perceived Usefulness (PU) has a significant positive effect on Intention to Adopt (INT).

III. METHODOLOGY

A. Research Design

This study employed a quantitative cross-sectional survey design to investigate factors influencing teachers' intention to adopt blended project-based learning. The research design was explanatory and aimed to empirically test a theory-driven structural model extending the Technology Acceptance Model (TAM) by incorporating educational environment and motivational constructs. A cross-sectional approach was appropriate because the study sought to capture teachers' perceptions, attitudes, and intentions at a single point in time within their natural instructional contexts.

The research was conducted in Lampung Province, Indonesia. This region represents many Global South contexts where initiatives related to Industry 4.0 in education coexist with infrastructural limitations and uneven access to professional development. The study involved senior high school Indonesian language teachers, as this group has increasingly encountered blended and project-based instructional demands. Understanding their technology adoption behavior is therefore essential for supporting effective pedagogical transformation.

A purposive sampling technique was employed to ensure the relevance and quality of the collected data. Teachers were included if they had at least 2 years of teaching experience and had access to basic e-learning technologies, such as internet connectivity and digital devices. These criteria ensured that respondents had sufficient professional experience and technological familiarity to evaluate blended project-based learning practices meaningfully.

A total of 148 valid responses were obtained and included in the final analysis. Although the sample size was moderate, it met the commonly accepted requirements for Structural Equation Modeling (SEM), particularly given the proposed model's strong factor loadings and high communalities (Dewanda et al., 2025; Yu et al., 2023). The demographic characteristics of the respondents are summarized in Table 1.

TABLE 1
DEMOGRAPHIC PROFILE OF RESPONDENTS

Variable	Category	Frequency	Percentage (%)
School Type	Public	96	64.9
	Private	52	35.1
Age Group	< 30 years	11	7.4
	30 – 39 years	34	23.0
	40 – 49 years	51	34.5
	≥ 50 years	52	35.1
Education	Bachelor's (S1)	132	89.2
	Master's (S2)	16	10.8
Training History	Attended	24	16.2
	Not Attended	124	83.8
Teaching Experience	< 5 years	11	7.4
	5 – 10 years	20	13.5
	> 10 years	117	79.1
Gender	Male	59	39.9
	Female	89	60.1
Total		148	100.0

Table 1 shows that the sample was dominated by highly experienced female teachers (60.1%), with 79.1% reporting more than ten years of teaching experience. In terms of academic qualifications, most participants held a Bachelor's degree (S1; 89.2%), while a smaller proportion had completed a Master's degree (S2; 10.8%). Notably, only 16.2% of respondents had previously attended formal training related to blended learning. This finding highlights the importance of examining motivational and contextual factors that may drive self-initiated adoption in the absence of structured professional development.

B. Instruments and Data Collection

Data were collected using a structured, self-administered questionnaire adapted from established, validated instruments reported in prior studies (Davis, 1989). The questionnaire items were carefully contextualized to reflect blended project-based learning practices in senior high school education while preserving conceptual equivalence with the original constructs. This adaptation enhanced contextual relevance without compromising theoretical integrity.

All questionnaire items were measured using a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The instrument consisted of six latent constructs: Educational Environment (EE), Blended Learning Motivation (BLM), Perceived Usefulness (PU), Perceived Ease of Use (PEU), Attitude (ATT), and Intention to Adopt (INT). Each construct was operationalized through multiple indicators to ensure adequate representation and measurement reliability.

The Educational Environment (EE) was measured using four items that captured infrastructure availability and institutional support. Blended Learning Motivation (BLM) was assessed using three items reflecting intrinsic interest and willingness to engage in blended learning. Perceived Usefulness (PU) and Perceived Ease of Use (PEU) were each measured using eight items, including reverse-coded statements, to assess perceived effectiveness, curriculum relevance, technical clarity, and ease of operation. Attitude (ATT) was measured using 8 items that captured affective evaluations

and beliefs toward blended project-based learning. Intention to Adopt (INT) was measured using three items reflecting future behavioral intentions.

Prior to the main data collection, the instrument underwent content and construct validation. Content validity was established through expert review involving scholars in educational technology and Indonesian language education, ensuring clarity, relevance, and alignment with the study objectives. Construct validity was then confirmed through Confirmatory Factor Analysis (CFA), with all retained items demonstrating standardized factor loadings above the recommended threshold. These results indicated that the instrument satisfied accepted validity criteria. Only questionnaires that were fully completed and met the inclusion criteria were retained for analysis. This screening procedure ensured data accuracy and consistency and strengthened the robustness of subsequent statistical analyses.

C. Data Analysis

Data analysis followed a systematic multi-stage procedure using IBM SPSS Statistics 26 and AMOS 22. In the first stage, SPSS was used to screen the data, including checks for missing values, outliers, and normality. Descriptive statistics were also generated to summarize the respondents' demographic characteristics. These preliminary analyses ensured that the dataset satisfied the assumptions required for SEM.

The second stage involved Structural Equation Modeling (SEM) using AMOS. Confirmatory Factor Analysis (CFA) was first conducted to evaluate the measurement model, focusing on indicator reliability, construct reliability, and convergent validity. These properties were assessed through standardized factor loadings, composite reliability, and average variance extracted. The measurement model was considered acceptable once all constructs met the recommended cut-off values.

After validating the measurement model, structural path analysis was performed to test the hypothesized relationships among constructs in the proposed conceptual framework. Model fit was evaluated using multiple goodness-of-fit indices, and the significance of each structural path was examined to determine empirical support for the hypotheses. SEM was selected because it enables the simultaneous estimation of complex relationships among latent variables while accounting for measurement error. This capability makes SEM particularly suitable for theory-testing research in educational technology adoption.

IV. RESULTS AND DISCUSSION

A. Measurement Model Evaluation

The robustness of the measurement model was examined using Confirmatory Factor Analysis (CFA) to assess the validity and reliability of the proposed constructs. The results indicated strong correspondence between the empirical data and the hypothesized measurement structure. This finding suggests that the observed indicators adequately represented their respective latent variables. Figure 2 presents the full CFA model estimated using AMOS.

As illustrated in Figure 2, all retained indicators exhibited standardized factor loadings above the recommended threshold of 0.60, indicating satisfactory convergent validity. This result confirms that each item contributed meaningfully to its underlying construct and consistently captured the intended theoretical dimensions. In addition, the overall model fit indices indicated excellent fit, with $CMIN/df = 1.067$, $RMSEA = 0.021$, $CFI = 0.984$, and $TLI = 0.982$. These values exceeded commonly accepted cut-off criteria, demonstrating that the measurement model achieved strong empirical adequacy.

The strong fit of the measurement model provided a robust foundation for subsequent structural analysis. It also supports extending the Technology Acceptance Model with Educational Environment and Blended Learning Motivation to examine blended project-based learning adoption in senior high school contexts, as suggested by prior methodological studies in educational technology research (Dewanda et al., 2025; Yu et al., 2023).

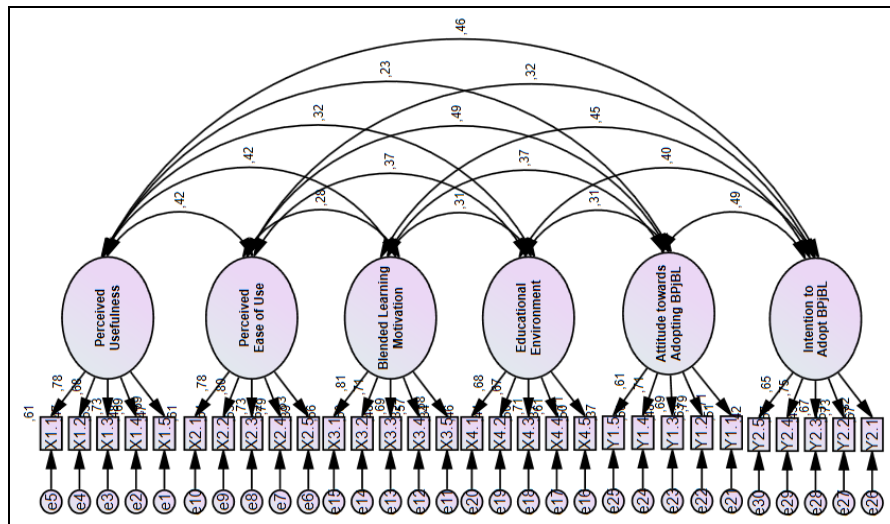


Figure 2. Confirmatory Factor Analysis (CFA)

B. Structural Model Results and Hypothesis Testing

Following validation of the measurement model, the structural model was tested to examine the hypothesized relationships among cognitive, motivational, and contextual variables. The standardized path estimates and the overall structural configuration are presented in Figure 3, which illustrates both the magnitude and direction of relationships among the latent constructs.

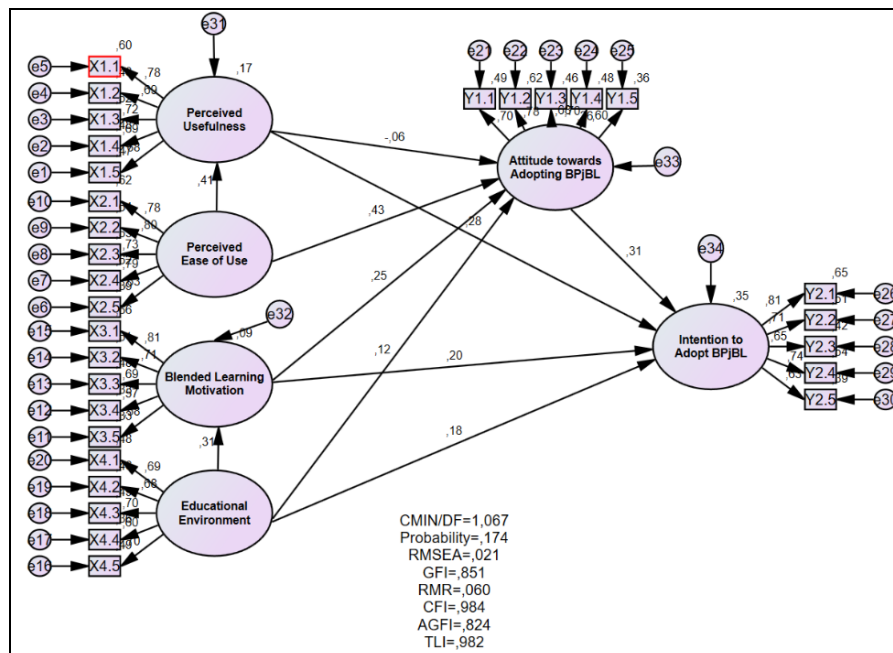


Figure 3. Structural Model Results (Standardized Estimates)

As shown in Figure 3, the structural model revealed a coherent pattern in which both affective and pragmatic mechanisms jointly shaped teachers' intention to adopt blended project-based learning. The strongest paths converged on Intention to Adopt (INT), particularly from Attitude (ATT) and Perceived Usefulness (PU). In contrast, contextual and motivational variables influenced intention primarily through indirect pathways rather than through direct effects. The detailed results of hypothesis testing are summarized in Table 2.

TABLE 2
STRUCTURAL PATH ANALYSIS RESULTS

Hypothesis	Path	Estimate (β)	C.R. (t-value)	p-value	Result
H1	PEU $\rightarrow$ PU	0.463	3.831	***	Supported
H2	EE $\rightarrow$ BLM	0.274	2.826	0.005	Supported
H3	PU $\rightarrow$ ATT	-0.066	-0.600	0.548	Rejected
H4	PEU $\rightarrow$ ATT	0.495	3.633	***	Supported
H5	BLM $\rightarrow$ ATT	0.288	2.362	0.018	Supported
H6	EE $\rightarrow$ ATT	0.123	1.179	0.238	Rejected
H7	EE $\rightarrow$ INT	0.195	1.821	0.069	Rejected
H8	BLM $\rightarrow$ INT	0.153	1.945	0.052	Rejected
H9	PU $\rightarrow$ INT	0.321	2.944	0.003	Supported
H10	ATT $\rightarrow$ INT	0.340	3.170	0.002	Supported

Note: *** indicates $p < 0.001$

Consistent with the Technology Acceptance Model, Perceived Ease of Use (PEU) exerted a strong and statistically significant effect on Perceived Usefulness (PU) ($\beta = 0.463$, $p < 0.001$). This finding indicates that teachers who perceived blended project-based learning as technically easy to implement were more likely to consider it pedagogically useful. This relationship reflects TAM's core cognitive logic and aligns with prior studies showing that usability enhances perceived instructional effectiveness, particularly in complex pedagogical innovations (Gómez et al., 2020; Porkodi & Tabash, 2024).

Perceived Ease of Use also demonstrated a substantial positive effect on attitude ($\beta = 0.495$, $p < 0.001$). This result indicates that technical simplicity played a central role in shaping teachers' affective evaluations. Teachers' emotional responses toward blended project-based learning were therefore influenced by how manageable the technology felt in practice, rather than solely by its anticipated instructional benefits. Similar patterns have been reported in blended and digital pedagogy research, where ease of use reduced cognitive strain and facilitated more positive attitudes (Engelbertink et al., 2021; Tong et al., 2020).

In contrast, Perceived Usefulness did not significantly influence attitude ($\beta = -0.066$, $p = 0.548$), thereby rejecting H3. This result deviates from the classical TAM assumption proposed by Davis (1989), which suggests that perceived usefulness shapes intention through affective attitudes. However, as shown in Figure 3 and Table 2, Perceived Usefulness exerted a strong and significant direct effect on Intention to Adopt ($\beta = 0.321$, $p = 0.003$), providing support for H9.

This pattern suggests the presence of a pragmatic adoption pathway, in which teachers form adoption intentions based on instrumental evaluations of usefulness rather than emotional preferences. In Indonesian senior high schools, where technology use is closely linked to curriculum mandates and institutional accountability, teachers adopt blended, project-based learning because it supports instructional effectiveness and professional responsibilities. This finding aligns with previous studies conducted in mandatory or high-stakes educational environments, where perceived usefulness directly predicted adoption intention while the mediating role of attitude was reduced (Anthony Jnr, 2024; Machumu & Zhu, 2019).

C. Motivational and Contextual Effects

Regarding contextual and motivational factors, Educational Environment (EE) was found to significantly predict Blended Learning Motivation (BLM), supporting H2. This finding indicates that institutional support, infrastructure availability, and organizational conditions play an important role in shaping teachers' motivational readiness to engage with blended project-based learning. Access to digital resources, policy clarity, and administrative encouragement appear to strengthen teachers' willingness to explore and implement blended instructional approaches.

However, Educational Environment did not exert a significant direct effect on either attitude or Intention to Adopt, leading to the rejection of H6 and H7. This pattern suggests that favorable environmental conditions alone are insufficient to trigger affective acceptance or adoption intention directly. Instead, the influence of the educational environment operates through more distal psychological mechanisms, particularly teachers' motivation.

From a theoretical perspective, these findings align with Herzberg's Two-Factor Theory, which distinguishes between hygiene factors and motivators. In this study, the educational environment functioned as a hygiene factor that reduced barriers and prevented dissatisfaction but did not independently motivate adoption behavior (Porkodi & Tabash, 2024). Similar patterns have been reported in studies conducted in developing educational systems, where environmental readiness facilitated teachers' motivation but did not automatically translate into implementation or behavioral intention (Al-Abdullatif & Gameil, 2021; Antwi-Boampong, 2020). In such contexts, limited infrastructure and weak institutional support have been shown to suppress motivation and intensify resistance, even when pedagogical innovations are perceived as beneficial (Anthony Jnr, 2024; X. Chen et al., 2022).

Blended Learning Motivation demonstrated a significant positive effect on attitude, supporting H5 and highlighting its role as an affective catalyst in the adoption process. When teachers experience higher levels of intrinsic motivation, such as pedagogical interest and curiosity, or extrinsic motivation, such as professional recognition and career advancement, they are more likely to develop positive emotional evaluations of blended project-based learning. This relationship is consistent with Self-Determination Theory, which suggests that supportive environments enhance teachers' sense of competence and security, thereby fostering intrinsic motivation and more positive affective responses

(Daniel et al., 2024).

However, Blended Learning Motivation did not significantly predict Intention to Adopt directly, leading to the rejection of H8. This finding indicates that motivation alone is insufficient to generate adoption intention without mediation by cognitive or affective mechanisms. In professional and semi-mandatory contexts such as senior high school education, teachers' adoption decisions remain strongly influenced by pragmatic considerations and evaluations of instructional usefulness. This layered mechanism underscores the importance of conceptualizing technology adoption as a multi-stage, context-dependent process (Machumu & Zhu, 2019; Porkodi & Tabash, 2024).

D. Mediation Analysis and Dual Adoption Pathways

To further clarify the mechanisms underlying teachers' adoption decisions, a mediation analysis was conducted using the Sobel Test. The results showed that attitude significantly mediated the relationship between Perceived Ease of Use and Intention to Adopt. This finding indicates that teachers' perceptions of technical simplicity influenced their adoption intentions primarily by shaping positive affective evaluations.

Because Perceived Ease of Use did not demonstrate a significant direct effect on intention, the mediation can be interpreted as a full mediation. In practical terms, ease of use increased teachers' emotional comfort and reduced anxiety, thereby strengthening their intentions to adopt blended project-based learning. This result highlights attitude as a key psychological mechanism that translates cognitive ease into behavioral intention.

The findings did not support attitude as a mediator between Perceived Usefulness and Intention to Adopt. Instead, Perceived Usefulness directly influenced adoption intention without passing through affective evaluation. Taken together, these findings indicate the existence of two distinct adoption pathways. The first is an affective pathway driven by Perceived Ease of Use and mediated by attitude. While the second is a pragmatic pathway in which Perceived Usefulness directly shapes teachers' intention to adopt blended project-based learning.

This dual-path mechanism aligns with recent critiques of TAM in professional and institutional contexts. These studies argue that affective mediation becomes weaker when adoption is driven by obligation, accountability, and performance expectations rather than voluntary preference (Moradi, 2025; Porkodi & Tabash, 2024). In such contexts, teachers may adopt technology because it is useful and necessary, even when their emotional attachment remains limited.

E. Contextual Constraints and Pragmatic Technology Adoption

The adoption pattern observed in this study differs from those reported in many studies conducted in Western countries and higher education settings. In digitally mature educational systems, higher levels of digital literacy and more stable infrastructure typically reduce usability barriers. As a result, perceived usefulness is more likely to shape teachers' attitudes directly (Engelbertink et al., 2021; Tulinayo et al., 2018). Under these conditions, teachers tend to develop positive affective responses to technology based on its instructional benefits.

In contrast, senior high school Indonesian language teachers in this study operated within constrained environments characterized by uneven access to technology, limited infrastructure, and inconsistent professional training. These contextual limitations increased the importance of perceived ease of use and pragmatic utility in shaping adoption decisions (Pasternak et al., 2023). When technical complexity remained high, affective anxiety tended to increase, making ease of use a critical gatekeeper for emotional acceptance.

The pragmatic orientation identified in this study is better understood as an adaptive response to contextual constraints rather than resistance to pedagogical innovation. Within such contexts, teachers may adopt blended project-based learning primarily to sustain instructional quality and comply with institutional expectations, even when affective endorsement remains limited. This response reflects how teachers navigate structural limitations while maintaining effective instructional practices. The finding is consistent with previous research on technology adoption in the Global South, which highlights compliance-driven and utility-oriented adoption pathways under conditions of strong policy pressure and limited professional autonomy (Guo et al., 2023; Luo, 2025; Moradi, 2025).

F. Theoretical and Practical Implications

From a theoretical perspective, this study contributes to refining the Technology Acceptance Model by demonstrating that the classic Beliefs–Attitudes–Intentions pathway does not fully explain technology adoption in compulsory education contexts. The findings introduce Teacher Pragmatism as a context-sensitive extension of TAM. They also show that Perceived Usefulness can directly shape adoption intention when teachers' decisions are influenced by professional obligations rather than personal preference. By incorporating Educational Environment and Blended Learning Motivation, this study offers a more ecological and motivational perspective on educational technology adoption in developing-country contexts.

From a practical perspective, the findings have important implications for policymakers, school leaders, and professional development providers. First, improving infrastructure and institutional support remains essential for maintaining teachers' motivation, even if these factors do not directly trigger adoption intentions. Second, professional development programs should emphasize technical simplicity and usability. Ease of use plays a crucial role in shaping teachers' affective acceptance of blended project-based learning. Finally, policy communication strategies should highlight the functional and instructional value of blended project-based learning. Emphasizing these practical benefits

can align with teachers' pragmatic decision-making processes while encouraging long-term engagement through a supportive and user-friendly implementation environment.

V. CONCLUSION

This study extended the Technology Acceptance Model (TAM) by incorporating motivational and environmental factors to better explain educational technology adoption among senior high school Indonesian language teachers. By integrating Blended Learning Motivation and the Educational Environment into the model, the findings show that technology adoption in mandatory educational contexts does not always follow the classical Belief–Attitude–Intention pathway. Instead, the results reveal a pattern of pragmatic adoption, in which teachers' intention to adopt blended project-based learning is driven primarily by cognitive evaluations of usefulness rather than affective attitudes. This pattern challenges traditional TAM assumptions, particularly in senior high school contexts where curriculum mandates, performance expectations, and resource constraints strongly influence teachers' decision-making.

In addition, the role of the Educational Environment is reinterpreted in this study. Rather than directly influencing adoption intention, the Educational Environment serves as an indirect antecedent, shaping teachers' motivational readiness. This readiness subsequently influences affective attitudes, which, in turn, contribute to adoption intention. These findings highlight that technology adoption should be viewed as a multi-stage and context-dependent process. This perspective is particularly relevant in developing countries, where institutional conditions and professional obligations strongly shape teachers' instructional practices.

The practical implications of this study are relevant for policymakers, school leaders, and professional development providers. First, teacher training programs should prioritize usability and reduce cognitive load. Since Perceived Ease of Use emerged as a key determinant of attitude, professional development should not focus solely on pedagogical theory. It should also provide practical support that simplifies the technical implementation of blended project-based learning. Second, strategies to encourage initial adoption should emphasize the functional benefits of blended project-based learning, such as improved instructional efficiency and alignment with curriculum standards. These practical benefits are likely to stimulate adoption through pragmatic pathways. However, sustained use requires technologies that remain intuitive and user-friendly, enabling teachers to create positive learning experiences over time. Finally, investment in infrastructure and the broader Educational Environment remains essential. Although it may not directly trigger adoption, it plays an important role in maintaining teachers' motivation and supporting the long-term use of innovative instructional practices.

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