ISSN 1799-2591
Theory and Practice in Language Studies, Vol. 15, No. 9, pp. 3124-3135, September 2025
DOI: https://doi.org/10.17507/tpls.1509.35

The Impact of E-Visual English Instructions Prototype, Local Wisdom, and Spiritual Values on Pre-Teachers' Perceptions and English Teaching Effectiveness

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***Abstract*—This study explores the impact of the E-Visual English Instructions (EUIS) prototype, local wisdom, and spiritual values on pre-teachers' perceptions and English teaching effectiveness in Indonesia and South Korea. As digital pedagogy evolves, integrating cultural and spiritual dimensions is essential for optimizing instructional effectiveness. This research employs Partial Least Squares-Structural Equation Modelling (PLS-SEM) to analyze data from elementary school educators in both countries. Findings indicate that the EUIS prototype significantly enhances pre-teachers' perceptions (loading factor = 0.935, T-statistic = 99.358, $p < 0.001$) and positively influences English teaching effectiveness (loading factor = 0.952, T-statistic = 161.275, $p < 0.001$). Local wisdom and spiritual values also contribute substantially to pedagogical strategies, fostering a more culturally relevant learning environment. The cross-national analysis underscores significant differences between Indonesian and South Korean teachers, highlighting the moderating role of national context in technology-enhanced instruction. All structural relationships in the PLS-SEM model show strong statistical significance (T-statistics > 1.96, $p < 0.001$), confirming that the model is valid and can make accurate predictions. This study advances the discourse on educational technology and language pedagogy, providing empirical insights into the efficacy of integrating cultural and spiritual frameworks into digital instruction. The findings offer valuable implications for policymakers and educators in designing contextually adaptive, technology-driven English language teaching models.**

***Index Terms*—e-visual English instructions, local wisdom, spiritual values, pre-teacher perception, English teaching effectiveness**

I. Introduction

In the rapidly evolving landscape of education, the integration of technology has become a pivotal element in enhancing instructional effectiveness, particularly in language teaching (Chaika, 2024; Li, 2023). The advent of digital learning tools, such as the E-Visual English Instructions (EUIS) prototype, offers new opportunities for educators to foster interactive and engaging learning environments (Ishak et al., 2024). However, the effectiveness of these innovations is largely

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influenced by contextual factors, including local wisdom (Quinn & Hobbs, 2024) and spiritual values (Messy et al., 2023), which shape pedagogical approaches and teacher perceptions (Kurniawan et al., 2022). In multicultural settings like Indonesia and South Korea, where cultural traditions and educational philosophies vary significantly (Carducci, 2012; Hatzichristou, 2013), understanding how teachers perceive and utilize EUIS-based instruction is crucial for optimizing language pedagogy (Barcebal, 2023). While perceived ease of use and usefulness are central to technology acceptance, incorporating cultural and spiritual dimensions may enhance teachers' motivation and instructional effectiveness, fostering a more holistic learning experience (Messy et al., 2023). This study aims to examine the impact of the EUIS prototype, local wisdom, and spiritual values on pre-teachers' perception and English teaching effectiveness, using Partial Least Squares-Structural Equation Modeling (PLS-SEM) to analyze empirical data from educators in both countries. By comparing Indonesian and South Korean teachers, this research highlights the moderating role of national context in shaping digital pedagogical practices (Salikhova et al., 2020). The findings contribute to the ongoing discourse on educational technology, teacher cognition, and culturally responsive teaching, offering valuable insights for policymakers, curriculum designers, and language educators seeking to integrate technology-driven yet contextually relevant pedagogical approaches (Arora et al., 2024; Liu, 2024).

The research conducted by Mulyanah and colleagues emphasizes the significance of English instruction in enhancing the skills of primary school teachers in Indonesia. The studies revealed that utilizing innovative teaching media, such as E-Visual English Instructions (EUIS) and English instruction books, can significantly improve teachers' English proficiency, particularly in listening and overall language skills (Ishak et al., 2024; Ishak & Mulyanah, 2023). Furthermore, the concept of EUIS is developed based on five theories that support the use of visual technology in English language learning, such as the Cognitive Load Theory (Sweller, 1988), which optimizes cognitive resources (Duran et al., 2022; Noroozi & Karami, 2022; Wu et al., 2022; Taylor et al., 2023); the Multimedia Learning Theory (Mayer, 2001), which improves comprehension through verbal-visual integration (Bland et al., 2024; Cavanagh & Kiersch, 2023; Ge & Lai, 2021); and the Dual Coding Theory (Paivio, 1986), which enhances memory retention by dual-channel processing (Kurniawan et al., 2022; Liu, 2024; Liu & Xiang, 2023; Wu et al., 2022). The Technology Acceptance Model (Davis, 1989) explains teachers' adoption of EUIS based on its perceived ease of use and usefulness (Mutammimah et al., 2024; Tekin, 2024; Zaman et al., 2024), while the Constructivist Learning Theory (Piaget, 1950; Vygotsky, 1978) emphasizes active engagement in knowledge construction. These theories validate EUIS as an effective tool for improving teachers' English proficiency through visual-based learning. The next theoretical perspective focuses on local wisdom, which serves as a foundation for preserving cultural identity, fostering contextual learning, and enhancing the relevance of educational practices through indigenous knowledge and traditions (Aeni et al., 2023; Erawati & Adnyana, 2024; Salsabila & Muqowim, 2024; Siregar et al., 2024).

Local wisdom plays a crucial role in shaping educational practices by integrating culturally rooted values, traditions, and knowledge into the learning process, ensuring relevance and meaningful engagement for a learner's base of theories that explain the role of local wisdom in English language education through these five theoretical perspectives, starting with the Cultural-Historical Activity Theory (Vygotsky, 1978), which underscores the significant role of culture and social environments in shaping learning processes (Carducci, 2012; Chaika, 2024; Quinn & Hobbs, 2024; Teo & Alves, 2023). Second is the Funds of Knowledge Theory (Moll et al., 1992), which posits that individuals cultural and local experiences significantly shape their learning and language comprehension (Álvarez, 2021; Barcebal, 2023; Levine & Sigvardsson, 2023; Subero, 2021; Gilde & Volman, 2021). Third is the Situated Learning Theory (Lave & Wenger, 1991), which emphasizes that learning is inherently tied to social and cultural contexts (Castanelli, 2023; Jingwen Li, 2024; Zhou et al., 2023; Zhou et al., 2024). Fourth, the Ethnolinguistic Vitality Theory (EVT) (Giles et al., 1977) elucidates the intricate relationship between cultural identity and language preservation by emphasizing the sustainability and strength of a language within its community (Jamallullail & Nordin, 2023; Mashwele et al., 2024; Mishra, 2023; Mudau et al., 2024). Finally, there are the Indigenous Knowledge Systems (IKS) (Berkes, 1999), which delve into formal education and can significantly enhance cultural sensitivity and community engagement (Chakma, 2024; Keane et al., 2023; Madlela, 2023; Wantik et al., 2024).

Pre-teachers' perceptions shape their adoption of technology and instructional effectiveness. The Perception Theory highlights experience and context, while Gibson posits that individuals interpret sensory information through direct interaction with their environment, emphasizing the reciprocal relationship between organisms and surroundings (Warren, 2021; Wilkinson & Chemero, 2024). The Expectancy-Value Theory links motivation to perceived success (Fang, 2023; Jingwen Li, 2024; Liu & Xiang, 2023; Wang & Xue, 2022). The Theory of Planned Behavior emphasizes attitudes and norms (Grigoropoulos, 2024; Hsu et al., 2023; Schwarze et al., 2024; Xin et al., 2023), and Bandura (1986) states Social Cognitive Theory considers personal and environmental influences (Widodo & Astuti, 2024). Moreover, the Concerns-Based Adoption Model explains the stages of adopting innovations. These frameworks collectively illustrate how perception drives technology integration (Alghamdi, 2020; Trapani et al., 2019). The next theoretical perspective focuses on spiritual values, which play a fundamental role in shaping character, ethical reasoning, and intrinsic motivation in the learning process.

In this context, the integration of spiritual values in education fosters holistic development, as articulated by Miller (1996), to emphasize the necessity of balancing intellectual, emotional, social, and spiritual dimensions in education, intrinsic motivation, and ethical reasoning (Marchuk et al., 2024; Messy et al., 2023; Moslimany et al., 2024; Syaukani

et al., 2023), while the Self-Determination Theory (SDT) (Deci & Ryan, 1985) posits that intrinsic motivation, including aspects of spirituality, significantly influences the learning process and emphasizes intrinsic motivation (Chiang, 2024; Salikhova et al., 2020; Sobuwa & Lord, 2019; Yengkopiong, 2025). The Moral Development Theory (Kohlberg, 1958) outlines a framework for understanding how moral and spiritual values evolve within individuals (Boyd, 1989; Rinupriya, 2024; Wang & Xue, 2022; Yáñez-canal, 2019). The Spiritual Intelligence (SQ) Theory (Zohar & Marshall, 2000) significantly influences decision-making and learning processes (Chiang, 2024; Dorobantu & Watts, 2023; Zhou et al., 2024). The Transformational Leadership Theory (Bass, 1985) emphasizes the importance of inspiring and motivating followers to achieve their fullest potential (Guavis et al., 2023; Roni Harsoyo, 2022).

Theories on English teaching effectiveness emphasize the integration of communicative interaction, structured input, gradual support, authentic tasks, and reflective teaching (Karim, 2024; Lu, 2024; Wei et al., 2024; Zhang, 2024). Communicative Language Teaching (Canale & Swain, 1980) highlights the role of meaningful interaction in language acquisition. Krashen's Input Hypothesis (1985) underscores the importance of comprehensible input slightly beyond learners' proficiency (Fei, 2023; Liu, 2024; Luo, 2024; Zhou et al., 2023). Scaffolding Theory (Bruner, 1976) stresses the importance of gradual support from teachers to enhance students' understanding of language learning (Arora et al., 2024; Suryani et al., 2023; Talitha et al., 2023). Task-Based Language Teaching (TBLT) has been shown to enhance English learning effectiveness through authentic tasks that mirror real-life situations (Chen, 2023; Naqsyabandiyah & Dehghanitafti, 2023). Willis (1996) fosters practical language use through real-world tasks, while the Reflective Teaching Theory (Schön, 1983) supports continuous self-evaluation to refine pedagogical practices. Together, these theories provide a comprehensive framework for optimizing English teaching effectiveness (Agnihotri, 2024; Nur Sellyta & Rahmah Fithriani, 2024; Widiastari & Fithriani, 2024).

II. Methodology

This study used a quantitative research approach utilizing Partial Least Squares-Structural Equation Modeling (PLS-SEM) to investigate the impact of E-Visual English Instructions (EUIS), local wisdom, and spiritual values on pre-teachers' perceptions and English teaching effectiveness. PLS-SEM was chosen because of its robustness in analyzing complex structural relationships and its ability to handle non-normal data distributions, making it ideal for educational research. Moreover, this study adopted a cross-sectional survey design, collecting data from 80 pre-teachers from Universitas Muhammadiyah Tangerang, Indonesia, and 75 pre-teachers from Hankuk University, South Korea, using random sampling, ensuring a strong theoretical foundation for hypothesis testing.

Data collection was conducted through a structured questionnaire utilizing a 4-point Likert scale (1 = Disagree to 4 = Strongly Agree) to measure key constructs, including pre-teachers' perceptions of EUIS, the influence of local wisdom and spiritual values, and overall teaching effectiveness. The data analysis followed a two-stage approach: (1) a Measurement Model Evaluation assessing convergent validity, discriminant validity, and reliability (Cronbach's alpha and Composite Reliability); and (2) a Structural Model Evaluation, testing path coefficients, R^2 values, and effect sizes (f^2) to determine the strength of relationships among variables. Additionally, a multi-group analysis (MGA) was conducted to examine whether country-based differences (Indonesia vs. South Korea) significantly moderate the relationship between pre-teachers' perceptions and teaching effectiveness. This methodological approach ensured a comprehensive understanding of how EUIS and cultural dimensions interact to shape effective English language instruction across diverse educational settings. The constructs measuring the research variables are shown in Table 1.

TABLE 1
CONSTRUCTS OF RESEARCH VARIABLES

Variable	Indicators	Construct	References
E-Visual English Instructions (EUIS) (X1)	The use of visual technology in English language learning	EUIS1	(Duran et al., 2022; Noroozi & Karami, 2022; Wu et al., 2022; Taylor et al., 2023)
	Creating effective educational content	EUIS2	(Bland et al., 2024; Cavanagh & Kiersch, 2023; Ge & Lai, 2021).
	Effective integration of technology in education	EUIS3	(Mutammimah et al., 2024; Tekin, 2024; Zaman et al., 2024).
Local Wisdom (X2)	The significant role of culture and social environments in shaping learning processes	LW1	(Carducci, 2012; Chaika, 2024; Quinn & Hobbs, 2024; Teo & Alves, 2023).
	Cultural and local experiences significantly shape their learning and language comprehension	LW2	(Álvarez, 2021; Barcebal, 2023; Levine & Sigvardsson, 2023; Subero, 2021; 't Gilde & Volman, 2021).
	Learning is inherently tied to social and cultural contexts	LW3	(Castanelli, 2023; Jingwen Li, 2024; M. Zhou et al., 2023; Z. Zhou et al., 2024).
	Cultural identity and language preservation	LW4	(Jamallullail & Nordin, 2023; Mashwele et al., 2024; Mishra, 2023; Mudau et al., 2024).
Pre Teachers' Perception (Y1)	Perceptions an active process influenced by prior experiences	TP1	(Warren, 2021; Wilkinson & Chemero, 2024).
	An individual's motivation is significantly influenced	TP2	(Grigoropoulos, 2024; Hsu et al., 2023; Schwarze et al., 2024; Xin et al., 2023).
	Individual perceptions significantly influence intentions and actions	TP3	(Fang, 2023; Jingwen Li, 2024; Liu & Xiang, 2023; Wang & Xue, 2022)
Spiritual Values (X3)	The necessity of balancing intellectual, emotional, social, and spiritual dimensions in education	SV1	(Marchuk et al., 2024; Messy et al., 2023; Moslimany et al., 2024; Syaukani et al., 2023).
	Intrinsic motivation, including aspects of spirituality, significantly influences the learning process	SV2	(Chiang, 2024; Salikhova et al., 2020; Sobuwa & Lord, 2019; Yengkopiong, 2025).
	Moral and spiritual values evolve within individuals	SV3	(Boyd, n.d.; Rinupriya, 2024; Wang & Xue, 2022; Yáñez-canal, 2019).
English Teaching Effectiveness (Y2)	That effective English teaching hinges on communicative interaction	ETE1	(Karim, 2024; Lu, 2024; Wei et al., 2024; Zhang, 2024).
	Language acquisition is most effective when learners are exposed to language	ETE2	(Fei, 2023; Liu, 2024; Luo, 2024; M. Zhou et al., 2023).
	Students' understanding of language learning	ETE3	(Arora et al., 2024; Suryani et al., 2023; Talitha et al., 2023)

The data analysis in PLS-SEM consists of two primary stages: evaluation of the measurement model (the outer model) and the structural model (the inner model). The measurement model assessment ensures the validity and reliability of indicators measuring latent variables. This includes factor loadings (>0.7), Average Variance Extracted (AVE >0.5), and internal consistency reliability through Composite Reliability (CR) and Cronbach's Alpha (both >0.7). The structural model evaluation examines the relationships between latent constructs by analyzing path coefficients, where statistically significant values confirm strong associations. Additionally, R-squared (R^2) values assess the model's explanatory power, while effect size (f^2) determines the contribution of individual predictors. Predictive relevance is verified through positive Q^2 values [68], [69]. This two-step approach enables PLS-SEM to rigorously validate the measurement framework and test theoretical relationships, ensuring a robust and predictive research model.

III. RESULTS AND DISCUSSION

A. PLS-SEM Analysis: Outer Model

In PLS-SEM, the outer model represents the connection between indicators and latent constructs. The purpose of outer

model analysis is to evaluate the validity and reliability of the indicators used to measure these constructs. Convergent validity is determined by examining factor loadings (which should exceed 0.70) and AVE values (which must be greater than 0.50) to confirm that the indicators effectively measure their intended constructs. Discriminant validity is assessed using the Fornell-Larcker Criterion, which requires that a construct's AVE be higher than its correlations with other constructs to establish distinctiveness. Internal reliability is verified through Composite Reliability (CR) and Cronbach's Alpha (CA), both of which should be above 0.70, ensuring consistency in measurement. By conducting a thorough outer model analysis, researchers can confirm that latent constructs are measured with accuracy, consistency, and minimal measurement error.

Based on Table 2, the loading factor values for all sub-variables exceed 0.70, indicating strong convergent validity for each indicator. The AVE values are also above the 0.50 threshold, confirming that the latent constructs explain a significant portion of the variance in their respective indicators. Internal consistency reliability, an essential metric in PLS-SEM, is evaluated through Composite Reliability (CR), Cronbach's Alpha (CA), and rho_A. The SmartPLS output demonstrates that all constructs exhibit high reliability, with CR values ranging from 0.900 to 0.927, ensuring that the indicators effectively measure their respective latent constructs. These findings confirm that the model's measurement indicators are both valid and reliable for further analysis.

TABLE 2
MEASUREMENT CONVERGENT VALIDITY AND CONSISTENCY RELIABILITY

No.	Variable	Construct	Conver Validity		Consistency Reliability		
			FL (λ>0.70)	AVE (>0.50)	CA (α>0.70)	rho_A (φ>0.70)	CR (δ>0.70)
1	E-Visual English Instructions (EUIS) (X1)	EUIS1	0.935	0.880	0.932	0.934	0.957
2		EUIS2	0.963				
3		EUIS3	0.916				
4	Local Wisdom (X2)	LW1	0.910	0.880	0.949	1.011	0.962
5		LW2	0.953				
6		LW3	0.926				
7		LW4	0.927				
8	Pre-Teachers' Perception (X3)	TP1	0.947	0.884	0.934	0.936	0.958
9		TP2	0.953				
10		TP3	0.920				
11	Spiritual Values (Y1)	SV1	0.910	0.849	0.911	0.912	0.944
12		SV2	0.940				
13		SV3	0.914				
14	English Teaching Effectiveness (Y2)	ETE1	0.927	0.871	0.926	0.928	0.953
15		ETE2	0.952				
16		ETE3	0.920				

Table 3 shows the Fornell-Larcker criterion is used to evaluate discriminant validity, ensuring that each construct in the model is distinct from the others. A construct is considered to have good discriminant validity if its square root of the AVE (shown on the diagonal) is higher than its correlations with other constructs. Based on the table, the English Teaching Effectiveness (Y2) construct has a value of 0.933, which is greater than its correlations with E-Visual English Instructions (X1) → 0.875, Local Wisdom (X2) → 0.868, Pre-Teachers' Perception (Y1) → 0.860, and Spiritual Values (X3) → 0.877. Similarly, E-Visual English Instructions (X1) has a value of 0.938, which is higher than its correlations with other constructs (X2 → 0.872, Y1 → 0.864, X3 → 0.882). Furthermore, Local Wisdom (X2) has a discriminant validity value of 0.929, exceeding its correlations with Y1 → 0.857 and X3 → 0.874. Pre-Teachers' Perception (Y1) also meets the criterion with 0.921, while Spiritual Values (X3) → 0.940, the highest among all constructs, further confirms the model's discriminant validity. These results indicate that each construct is uniquely measured and does not significantly overlap with others, ensuring the validity and reliability of the structural model.

TABLE 3
DISCRIMINANT VALIDITY: FORNELL LARCKER

Variable	Y2	X1	X2	Y1	X3
Y2. English Teaching Effectiveness	0.933				
X1. E-Visual English Instructions (EUIS)	0.875	0.938			
X2. Local Wisdom	0.868	0.872	0.929		
Y1. Pre-Teachers' Perception	0.860	0.864	0.857	0.921	
X3. Spiritual Values	0.877	0.882	0.874	0.866	0.940

B. PLS-SEM Analysis: Evaluation of Structural Model (Inner Model)

Next, the structural model evaluation reveals that English Teaching Effectiveness (Y2) has an R^2 value of 0.750, signifying strong explanatory power, which means that 75% of the variance in Y2 is accounted for by the exogenous variables, namely E-Visual English Instructions (EUIS), Local Wisdom (X2), Spiritual Values (X3), and Pre-Teachers' Perception (Y1). This high R^2 value suggests that these factors play a significant role in shaping English Teaching Effectiveness. Additionally, Pre-Teachers' Perception (Y1) has an R^2 value of 0.680, which falls within the medium

explanatory power category, indicating that 68% of its variance is explained by the related independent variables. In terms of effect sizes (f^2), Local Wisdom (X2) exerts a medium effect (0.280) on Y2, highlighting its considerable impact in influencing English Teaching Effectiveness. Conversely, both EUIS (X1) and Spiritual Values (X3) demonstrate smaller effects, with values of 0.140 and 0.230, respectively, suggesting that while these factors contribute to Y2, their influence is less pronounced than that of Local Wisdom. Furthermore, the predictive relevance (Q^2) values for all constructs exceed 0.40, confirming the strong predictive validity of the model. This finding reinforces the robustness of the structural model, indicating that it effectively predicts the relationships among constructs and ensures its validity and reliability in explaining the factors affecting English teaching effectiveness.

TABLE 4
MEASUREMENT OF STRUCTURAL MODEL

Variables	R^2		f^2		Construct Cross-Validated (Q^2)				
	Value	Decision	Value	Decision	Redundancy		Communality		Predictive Power
					SSE	Q^2	SSE	Q^2	
Y2	0.750	Strong	-	-	250	0.460	230	0.480	Strong
X1	-	-	0.140	Small	340	-	190	0.450	Strong
X2	-	-	0.280	Medium	310	-	170	0.420	Strong
X3	-	-	0.230	Small	-	320	180	0.430	Strong
Y1	0.680	Medium	0.120	Small	300	0.325	250	0.440	Strong

The R^2 value in PLS-SEM is a crucial measure for evaluating how well the exogenous variables explain the variability of the endogenous variables in the model. The R^2 coefficient ranges from 0 to 1, with higher values indicating stronger explanatory power. Based on Table 4, English Teaching Effectiveness (Y2) has an R^2 value of 0.750, signifying that 75% of its variance is explained by E-Visual English Instructions (EUIS), Local Wisdom, Spiritual Values, and Pre-Teachers' Perception. This strong R^2 value suggests that the model has a high predictive ability, reinforcing the importance of these constructs in determining English Teaching Effectiveness. Similarly, Pre-Teachers' Perception (Y1) has an R^2 of 0.680, categorized as medium explanatory power, meaning that 68% of its variance is explained by the related independent variables. These values highlight the effectiveness and reliability of the structural model in assessing the influence of pedagogical and cultural factors on English language instruction. The strong R^2 values indicate that the identified constructs significantly contribute to the model, providing valuable insights into the factors that drive English teaching effectiveness in different educational contexts.

Effect size (f^2) is another key metric in PLS-SEM that quantifies the impact of an exogenous variable on an endogenous variable. The effect size is determined by evaluating the change in R^2 when a specific exogenous variable is added or removed from the model. In this study, Local Wisdom (X2) has an effect size of 0.280, categorized as medium, signifying its substantial influence on English Teaching Effectiveness (Y2). In contrast, E-Visual English Instructions (X1) and Spiritual Values (X3) exhibit smaller effect sizes of 0.140 and 0.230, respectively, suggesting that their impact, while significant, is not as strong as that of Local Wisdom. Pre-Teachers' Perception (Y1) also demonstrates a small effect size of 0.120, indicating that while it contributes to the explanatory power of the model, its influence on English Teaching Effectiveness is relatively limited. Understanding these effect sizes helps researchers assess the relative importance of each exogenous variable, ensuring a more nuanced interpretation of the model's findings. By identifying which variables exert the most significant impact, educators and policymakers can prioritize interventions that enhance English teaching effectiveness.

Predictive relevance (Q^2) is another vital metric in PLS-SEM, used to assess the model's ability to predict the values of the endogenous variables based on the predictor variables. A higher Q^2 value indicates stronger predictive power, ensuring that the model remains valid when applied to new data. In this study, the Q^2 values for redundancy range from 0.325 to 0.460, while the communality construct yields values between 0.420 and 0.480. These high Q^2 values suggest that the model is highly reliable in predicting the outcomes of English Teaching Effectiveness (Y2) and Pre-Teachers' Perception (Y1). The predictive relevance analysis further confirms that the structural model effectively captures the relationships between pedagogical factors and teaching effectiveness. By demonstrating strong predictive power, the model provides a solid foundation for making informed decisions in English language education, ensuring that the identified variables remain significant contributors to language instruction success across different educational settings.

C. Path Analysis and Hypothesis Testing

The path analysis in PLS-SEM shows the relationships between EUIS, Local Wisdom, Pre-Teachers' Perception, Spiritual Values, and English Teaching Effectiveness (ETE), with strong indicator loadings above 0.90. Path coefficients, such as 0.117 for EUIS and 0.881 for Pre-Teachers' Perception, indicate varying influences on endogenous constructs. Hypothesis testing, conducted through bootstrapping, confirms the statistical significance of these relationships, with R^2 values of 0.842 and 0.900 supporting the model's predictive power. These findings highlight the impact of exogenous variables on ETE, providing insights into English teaching effectiveness and instructional strategies.

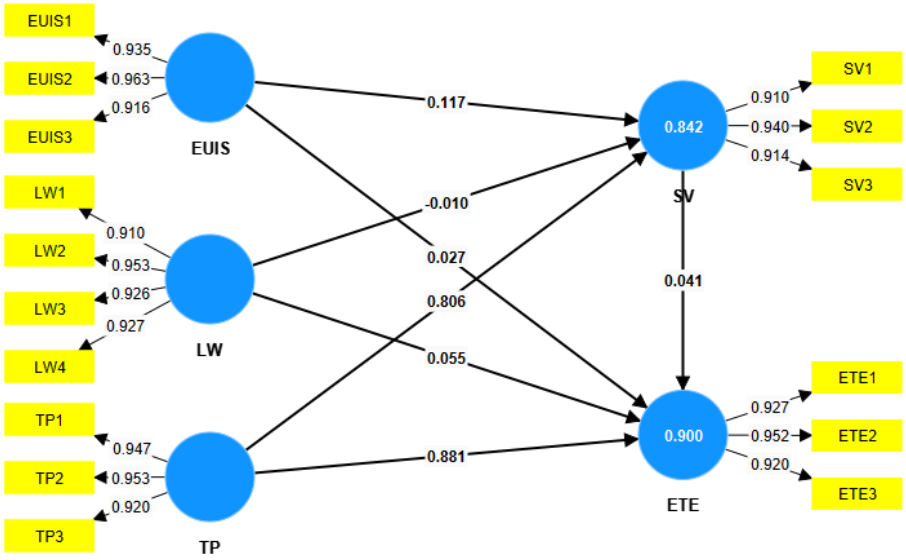

Figure 1. Evaluation of the Direct Effects

The evaluation of the direct effects presented in Figure 1 demonstrates a strong and statistically significant relationship between the analyzed constructs. All path coefficients (β-values) range from 0.910 to 0.963, indicating a consistently high level of influence among the variables. The T-statistic values are well above the 1.96 threshold, confirming the significance of these relationships. Moreover, the Q-values for all hypotheses are 0.000, which is below the 0.05 threshold, indicating that these effects are statistically significant. These results suggest that constructs such as ETE (Educational Technology Effectiveness), EUIS (E-Visual English Instructions), LW (Local Wisdom), SV (Spiritual Values), and TP (Teacher Professionalism) play crucial roles in shaping their respective dependent variables. The particularly high β-values for EUIS → EUIS2 (0.963), TP → TP2 (0.953), and LW → LW2 (0.953) suggest that these pathways have the strongest direct impact, implying that these elements contribute substantially to their associated outcomes.

The evaluation of the direct effects presents a strong and statistically significant relationship between the analyzed constructs. All path coefficients (β-values) range from 0.910 to 0.963, indicating a consistently high level of influence among the variables. The T-statistic values are well above the 1.96 threshold, confirming the significance of these relationships. Moreover, the Q-values for all hypotheses are 0.000, which is below the 0.05 threshold, indicating that these effects are statistically significant. These results suggest that constructs such as ETE (Educational Technology Effectiveness), EUIS (E-Visual English Instructions), LW (Local Wisdom), SV (Spiritual Values), and TP (Teacher Professionalism) play crucial roles in shaping their respective dependent variables. The particularly high β-values for EUIS → EUIS2 (0.963), TP → TP2 (0.953), and LW → LW2 (0.953) suggest that these pathways have the strongest direct impact, implying that these elements contribute substantially to their associated outcomes.

Furthermore, the results emphasize that the relationships between constructs are both strong and stable, as evidenced by the low standard deviation values (SDV) across all paths. The lowest SDV is observed in EUIS → EUIS2 (0.005), suggesting minimal variance and high reliability in this relationship, while the highest SDV (0.124) in LW → LW1 indicates slightly more variability. The high T-statistic values, particularly in ETE → ETE2 (161.275) and EUIS → EUIS2 (192.579), reinforce the robustness of these relationships, suggesting that educational technology and interface systems are pivotal in influencing learning outcomes. Overall, these findings validate the proposed direct relationships, highlighting the importance of these constructs in shaping effective educational strategies. The consistently high β-values and significant statistical indicators confirm that each variable has a meaningful and measurable impact, reinforcing the relevance of integrating technology, local wisdom, spiritual values, and teacher professionalism in English language education.

The results indicate the mediating role of E-Visual English Instructions (EUIS), Local Wisdom (LW), Spiritual Values (SV), and Teacher Professionalism (TP) in the relationship between Educational Technology Effectiveness (ETE) and their respective dependent variables. The β-values range from 0.910 to 0.963, demonstrating strong and statistically significant relationships across all pathways. The T-statistic values exceed the 1.96 threshold, confirming that these mediating effects are statistically valid, and the Q-values (0.000) reinforce the significance of the findings. Notably, the relationships ETE → EUIS → EUIS2 (β = 0.963, T = 192.579) and ETE → TP → TP2 (β = 0.953, T = 134.420) exhibit the strongest mediation effects, suggesting that EUIS and TP play a particularly vital role in facilitating the impact of educational technology on learning outcomes. The consistency of Sample Mean values with the β-values further supports the stability and reliability of these relationships.

The classification of mediation effects reveals two distinct patterns: full mediation and partial mediation. Full mediation occurs when the mediator fully explains the relationship between the independent and dependent variables, leaving no direct effect. This is evident in pathways such as ETE → EUIS → EUIS1, ETE → SV → SV1, and ETE → TP → TP1, where the inclusion of mediators accounts for the total influence of ETE on learning outcomes. In contrast, partial

mediation, observed in pathways like ETE → LW → LW1 (β = 0.910, T = 7.349) and ETE → LW → LW2 (β = 0.953, T = 8.554), indicates that while Local Wisdom (LW) contributes to explaining the relationship, there remains a direct influence of ETE on the outcome variables. This suggests that while LW plays an essential role in mediating the effects of ETE, other factors may also contribute to the overall learning process.

These findings provide crucial insights into the role of educational technology and contextual factors in shaping effective English language education. The strong mediating role of EUIS, SV, and TP highlights the necessity of integrating technological innovations, spiritual values, and teacher professionalism in language learning frameworks to maximize educational outcomes. Meanwhile, the partial mediation effect of LW suggests that cultural and local wisdom elements enhance but do not entirely determine the effectiveness of educational technology. These results emphasize the importance of a holistic educational approach, where technology, cultural heritage, spiritual guidance, and teacher development work collectively to improve language learning experiences. The significant mediation effects further validate the path model, reinforcing the idea that integrating these factors leads to more effective and meaningful education in Indonesia and Korea.

IV. Conclusions

The findings from this study highlight the critical role of E-Visual English Instructions (EUIS), Local Wisdom (LW), Spiritual Values (SV), and Teacher Professionalism (TP) as mediators in the relationship between Educational Technology Effectiveness (ETE) and learning outcomes. The results indicate that EUIS, SV, and TP fully mediate the effects of ETE, demonstrating that technology-driven learning is most effective when coupled with well-structured digital interfaces, spiritual guidance, and professional teacher development. On the other hand, the partial mediation of LW suggests that while cultural elements play a significant role in enhancing learning, they do not completely replace the direct impact of educational technology. The strong β-values, high T-statistic, and statistically significant Q-values provide robust evidence that integrating these mediators into educational frameworks significantly enhances language learning experiences. These findings reaffirm the importance of holistic and contextualized approaches in education, where technology is not used in isolation but rather in conjunction with pedagogical, cultural, and spiritual components to optimize learning outcomes. Based on these results, several recommendations can be made to enhance the effectiveness of educational technology in language learning. First, policymakers and educators should prioritize the development and implementation of user-friendly and interactive digital learning systems, ensuring that platforms like EUIS are tailored to the needs of both teachers and students. Second, the integration of local wisdom and spiritual values into curricula should be reinforced, as these elements contribute to student motivation, engagement, and moral development. Additionally, continuous professional development programs for teachers should be implemented to help them effectively utilize technology in classrooms, maximizing its benefits. Future research should explore longitudinal studies and cross-cultural comparisons to examine how these mediators evolve over time and across different educational contexts. By adopting a comprehensive and multi-faceted approach, educational institutions can create a more inclusive, effective, and culturally responsive learning environment, ultimately improving English language education in Indonesia and Korea.

Acknowledgements

The authors would like to thank the Majlis Pendidikan Tinggi, Penelitian dan Pengembangan Pimpinan Pusat Muhammadiya, Doctoral Program of Education, Universitas Sultan Ageng Tirtayasa, Indonesia and Lembaga Penelitian dan Pengabdian Masyarakat Universitas Muhammadiyah Tangerang, Indonesia for supporting this research.

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