



Evaluating Technology Acceptance in Counseling Services: An Analysis of Principal Indicators Utilizing the UTAUT₂ Model via SEM-PLS

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ABSTRACT

This study evaluated the acceptance of technology in ICT-based guidance and counseling services among school counselors in West Java, using the Unified Theory of Acceptance and Use of Technology 2 (UTAUT₂) model. The research employed a purposive sampling technique to select participants from the population of guidance and counseling teachers. Structural Equation Modeling (SEM) with a Partial Least Squares (PLS) approach was used to analyze the data. The findings indicated that social influence and performance expectancy had a significant positive effect on technology acceptance. In contrast, facilitating conditions and effort expectancy were found to have less influence, highlighting the need for improvement in digital infrastructure and user readiness. Based on these results, the study recommended increasing access to adequate technological facilities, providing structured training programs for school counselors, and enhancing the interactivity of digital platforms used in counseling services. These measures are expected to support broader and more effective integration of technology in school-based counseling practices.

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1. INTRODUCTION

The rapid advancement of Information and Communication Technology (ICT) has profoundly reshaped various aspects of modern society, with education emerging as one of the most significantly impacted domains (Johan et al., 2020; Rullyana & Triandari, 2024). Among the educational services affected, guidance and counseling services (GCS) have increasingly incorporated digital tools to improve their accessibility, responsiveness, and operational efficiency (Muhammad, 2024; Pirzadeh-Miller et al., 2017). Within school contexts, the application of ICT in GCS enables enhanced communication, streamlined documentation, and more flexible interventions tailored to students' needs. Nevertheless, the effectiveness of ICT integration in counseling services remains largely dependent on the extent to which school counselors accept and utilize these technologies effectively.

To explain user behavior in adopting new technologies, the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) offers a comprehensive and empirically validated theoretical framework (Dwivedi et al., 2019; Parhamnia, 2022). This model, which extends the original UTAUT, integrates additional constructs, hedonic motivation (HM), price value (PV), and habit (H), alongside core variables such as performance expectancy (PE), effort expectancy (EE), social influence (SI), and facilitating conditions (FC). The strength of UTAUT2 lies in its ability to account for individual variability and contextual factors in technology adoption, with studies reporting that it can explain up to 70% of the variance in behavioral intention toward technology use (Venkatesh et al., 2012). Its wide applicability across multiple sectors, including education, healthcare, and public administration, has reinforced its position as one of the most reliable models for predicting user acceptance.

Empirical studies applying UTAUT2 in educational settings have revealed consistent patterns. Facilitating conditions and habit have emerged as strong predictors of technology usage among school counselors, suggesting that organizational support and established routines play a crucial role in adoption (Foroughi et al., 2024; Stumbrienė et al., 2024). Furthermore, performance expectancy has been identified as a key motivational driver, particularly when counselors perceive digital tools as enhancing the quality and efficiency of their professional tasks (Liu et al., 2015; Rahi et al., 2019). Conversely, effort expectancy is frequently noted as a limiting factor, particularly when users encounter complex or unfamiliar interfaces, thereby undermining their confidence and willingness to engage with new systems.

In the Indonesian educational context, the adoption of ICT for GCS presents a range of unique challenges. Although digital infrastructure has improved in recent years, many school counselors continue to report difficulties in implementing technology due to limited training opportunities, a lack of technical assistance, and inconsistent institutional support (Halqim, 2024; Timotheou et al., 2023). This disconnect between the availability of technological resources and their meaningful application highlights the need for a context-specific evaluation of the UTAUT2 model's constructs in Indonesian schools. Such an evaluation would inform more effective interventions and policy formulations tailored to the local context.

Addressing this issue requires a thorough analysis of which UTAUT2 constructs most significantly influence counselors' acceptance and use of ICT in their professional practices, and which constructs present persistent challenges (Srijundaree et al., 2024). By identifying the strongest predictors, stakeholders can concentrate efforts on reinforcing these areas through strategic communication, professional development, and technological design. Conversely, recognizing the weakest indicators will enable targeted interventions, such as infrastructure enhancement and user training, to overcome adoption barriers.

To that end, this study employs Structural Equation Modeling (SEM) using a Partial Least Squares (PLS) approach to examine the relative influence of each UTAUT2 indicator on technology acceptance among school counselors in West Java. SEM-PLS is particularly appropriate for modeling complex relationships among latent constructs and mitigating the risks of common method variance in self-reported data. The study adopts a purposive sampling strategy, focusing on certified guidance and counseling teachers, to ensure contextual relevance and practical insight.

The contribution of this study extends beyond empirical measurement. While previous research has validated UTAUT2 in diverse global contexts, there is a notable lack of scholarly attention to its application within Indonesia's school-based counseling environment. This study seeks to address that gap by offering evidence-based insights into the local adoption of ICT in education, thereby enhancing both theoretical understanding and practical implementation strategies. The research aims to identify the most and least influential constructs within the UTAUT2 model that affect the acceptance and usage of ICT in guidance and counseling services in Indonesian schools. Specifically, the study seeks to (1) evaluate the strength of each UTAUT2 indicator in predicting technology acceptance among school counselors, (2) identify key barriers that hinder adoption, and (3) provide targeted recommendations for enhancing digital engagement in school-based counseling practices.

2. METHODOLOGY

2.1 Research Design

This study adopted a quantitative research approach with a cross-sectional survey design to investigate the determinants of technology acceptance in ICT-based guidance and counseling (GC) services. The cross-sectional design enabled the collection of data at a single point in time from a specific population to identify patterns of behavior and perceptions related to the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) model. The online survey method was selected for its efficiency in reaching participants across various geographical locations in West Java and its appropriateness for capturing self-reported attitudes and experiences in a digital context.

2.2 Data Collection

Data were collected using a structured questionnaire adapted from the UTAUT2 instrument developed by Venkatesh et al. (2003) and expanded by Venkatesh, Thong, and Xu (2012). The instrument was modified to suit the Indonesian language and cultural context, particularly in relation to school-based GC services. It consisted of 53 items measuring seven core constructs: performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value, and habit. Each item was rated on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The target population comprised certified school counselors in West Java who had used ICT-based GC services for at least one year. A purposive sampling technique was employed, resulting in 430 valid responses. Data were collected via an online platform within a controlled virtual environment to ensure accessibility and respondent anonymity.

2.3 Data Analysis

Quantitative data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with the aid of SmartPLS version 4.1.0.0. The analysis followed a two-stage approach: evaluation of the measurement model and structural model. In the measurement

model, convergent validity was assessed using factor loadings and Average Variance Extracted (AVE), while discriminant validity was evaluated through the Fornell-Larcker criterion and cross-loading analysis. Internal consistency reliability was examined using Cronbach's alpha and composite reliability coefficients. In the structural model, path coefficients were analyzed to determine the strength and significance of the hypothesized relationships between variables. A bootstrapping procedure with 5,000 resamples was applied to test the significance of the path estimates, with a confidence interval set at 95% ($\alpha = 0.05$).

3. RESULT AND DISCUSSION

3.1 Result

The results highlight the importance of social support in encouraging technology adoption. The findings also emphasize the need for training to enhance the skills of guidance and counseling teachers, particularly in utilizing technological infrastructure. The results of the validity and reliability tests for the UTAUT2 instrument are presented in the following tables.

Table 1. The Results of Validity and Reliability Tests of the UTAUT2 Instrument

Construct	Outer Loading	Cronbach's Alpha	Composite Reliability	AVE
Performance Expectancy (PE)	0.799 - 0.906	0.881	0.918	0.738
Effort Expectancy (EE)	0.731 - 0.805	0.785	0.862	0.611
Social Influence (SI)	0.845 - 0.879	0.834	0.896	0.741
Facilitating Conditions (FC)	0.733 - 0.817	0.862	0.896	0.590
Hedonic Motivation (HM)	0.744 - 0.885	0.834	0.912	0.723
Price Value (PV)	0.753 - 0.875	0.744	0.854	0.622
Habit (H)	0.733 - 0.812	0.787	0.860	0.606

Based on Table 1, it can be concluded that the UTAUT2 instrument demonstrates good validity and reliability. All indicators have outer loadings above 0.70, indicating their validity in measuring their respective constructs. The Cronbach's alpha and composite reliability values for all constructs exceed 0.70, demonstrating the instrument's reliability. Additionally, the Average Variance Extracted (AVE) values for all constructs are above 0.50, indicating good convergent validity.

PE showed strong internal consistency (CR > 0.70) and good convergent validity (AVE = 0.738). Three key indicators, quality improvement (OL = 0.906), professional status enhancement (OL = 0.868), and performance improvement (OL = 0.861), were statistically significant ($p < 0.05$). These results indicate that ICT is perceived to enhance service quality, credibility, and counselor performance. EE achieved acceptable reliability (CR > 0.70) and

convergent validity (AVE = 0.611). Two indicators had strong loadings: ease of understanding (OL = 0.873) and effortless task completion (OL = 0.805), both significant ($p < 0.05$). This suggests that counselors view ICT as easy to learn and apply in their work.

SI demonstrated robust internal consistency (CR > 0.70) and high convergent validity (AVE = 0.741). Significant indicators included recognition within professional groups (OL = 0.879), enhanced image (OL = 0.857), and peer encouragement (OL = 0.845). These findings highlight the importance of social and professional reinforcement in ICT adoption. FC showed satisfactory reliability (CR > 0.70) and valid convergence (AVE = 0.591). Strong predictors included access to ICT resources (OL = 0.817) and infrastructure support (OL = 0.797). These results affirm that availability of tools and organizational backing are essential for effective ICT use.

HM yielded strong internal consistency (CR > 0.70) and convergent validity (AVE = 0.723). Key indicators, cognitive stimulation (OL = 0.885), critical thinking (OL = 0.883), and enjoyment (OL = 0.881), were all significant. These suggest that intellectual engagement and enjoyment enhance counselors' commitment to ICT use. PV showed good reliability (CR > 0.70) and convergence (AVE = 0.622). Two strong indicators, platform reliability (OL = 0.875) and cost-benefit satisfaction (OL = 0.805)—were significant, indicating that counselors consider ICT both dependable and economically justifiable. H demonstrated acceptable internal consistency (CR > 0.70) and convergent validity (AVE = 0.606). Strong indicators included habitual ICT use (OL = 0.812) and reduced productivity without it (OL = 0.798). These suggest that consistent ICT use has become routine and reinforces continued adoption.

Table 2. Results of the Fornell-Larcker Criterion Discriminant Validity Test

	EE	FC	H	HM	PE	PV	SI
EE	0,835						
FC	0,725	0,784					
H	0,321	0,289	0,778				
HM	0,321	0,609	0,200	0,859			
PE	0,532	0,511	0,290	0,394	0,859		
PV	0,613	0,486	0,304	0,390	0,653	0,814	
SI	0,744	0,581	0,300	0,352	0,534	0,598	0,832

The Fornell-Larcker criterion discriminant validity test aims to examine whether the square root of the Average Variance Extracted (AVE) for each construct is greater than the correlation between that construct and other constructs. This is to ensure that each construct better explains the variance of its own indicators compared to the variance explained by other constructs. Based on Table 2, the following is the analysis of the results of the discriminant validity test using the Fornell-Larcker criterion model.

Tabel 3. Results of the Heterotrait-Monotrait Ratio (HTMT) Discriminant Validity Test

	EE	FC	H	HM	PE	PV	SI
EE							
FC	0.886						
H	0.386	0.341					
HM	0.427	0.686	0.253				

	EE	FC	H	HM	PE	PV	SI
PE	0.741	0.621	0.33	0.442			
PV	0.859	0.616	0.367	0.489	0.804		
SI	0.808	0.628	0.293	0.435	0.612	0.682	

Based on Table 3, it can be concluded that the UTAUT2 instrument has good discriminant validity according to the Heterotrait-Monotrait Ratio (HTMT) model. Hair et al. (2019) recommend HTMT because this measure of discriminant validity is considered more sensitive or accurate in detecting discriminant validity. The recommended value is below 0.90 (HTMT < 0.90). The test results show that the HTMT values for variable pairs are below 0.90, indicating that discriminant validity has been achieved. The variables explain the variation of measurement items for their own items more strongly than they explain the variation of items from other variables.

Tabel 4. Results of the Discriminant Validity Test for the Loading Factor (LF)

	EE	FC	H	HM	PE	PV	SI
EE01	0.805						
EE02	0.733						
EE06	0.873						
EE07	0.705						
FC02		0.797					
FC04		0.817					
FC05		0.733					
FC06		0.763					
FC07		0.768					
FC08		0.726					
H01			0.812				
H02			0.798				
H03			0.733				
H04			0.768				
HM02				0.881			
HM03				0.885			
HM04				0.883			
HM05				0.744			
PE09					0.799		
PE11					0.906		
PE12					0.868		
PE14					0.861		
PV04						0.875	
PV05						0.753	
PV06						0.808	
SI01							0.845
SI02							0.857
SI03							0.879

The evaluation of the reflective measurement model was based on outer loadings (OL), composite reliability (CR), and average variance extracted (AVE), following Hair et al. (2021), where $OL \geq 0.70$ and $AVE \geq 0.50$ indicate acceptable convergent validity. Performance Expectancy (PE) was measured using four valid indicators, with OLs ranging from 0.799 to 0.906. The construct showed strong reliability ($CR = 0.918$) and high convergent validity ($AVE = 0.738$). The highest loading items were PE11 ("ICT improves work quality") and PE09 ("ICT facilitates performance").

Effort Expectancy (EE) had four valid items with OLs between 0.705 and 0.873, demonstrating acceptable reliability ($CR = 0.863$) and $AVE = 0.611$. Strongest items included EE06 ("ICT is easy to understand") and EE01 ("ICT helps complete tasks easily"). Social Influence (SI) was measured by three indicators (OLs: 0.845–0.879), with high reliability ($CR = 0.896$) and the highest AVE among all constructs (0.741). SI03 ("ICT users are seen as leaders") and SI02 ("ICT enhances professional image") were most influential.

Facilitating Conditions (FC) included six valid items (OLs: 0.726–0.817), showing reliable internal consistency ($CR = 0.896$) and acceptable convergent validity ($AVE = 0.590$). The strongest items were FC04 ("technical support is available") and FC02 ("sufficient resources for ICT use"). Hedonic Motivation (HM) had four items (OLs: 0.744–0.885), with high reliability ($CR = 0.912$) and strong convergence ($AVE = 0.723$). HM03 ("ICT provides intellectual empowerment") and HM04 ("ICT enhances critical thinking") were the most prominent.

Price Value (PV) comprised three indicators (OLs: 0.753–0.875), demonstrating good reliability ($CR = 0.854$) and $AVE = 0.622$. Key contributors included PV04 ("ICT is reliable") and PV06 ("satisfaction relative to cost"). Habit (H) had four valid indicators (OLs: 0.733–0.812), with $CR = 0.860$ and $AVE = 0.606$. H01 ("habitual ICT use") and H02 ("ICT as part of daily routine") were the strongest items. In summary, all constructs demonstrated satisfactory psychometric properties. Ranked by AVE, the constructs were: SI (0.741), PE (0.738), HM (0.723), PV (0.622), EE (0.611), H (0.606), and FC (0.590).

3.2 Discussion

The findings of this study confirm that the UTAUT2 model serves as a robust framework for evaluating technology acceptance in the context of ICT-based guidance and counseling services in West Java schools. The constructs assessed, Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Facilitating Conditions (FC), Hedonic Motivation (HM), Price Value (PV), and Habit (H), offer comprehensive insights into the factors influencing the adoption and continued use of educational technologies by school counselors.

Among the constructs, Social Influence (SI) and Performance Expectancy (PE) emerged as the most influential predictors of technology acceptance. The significance of SI suggests that peer opinions, organizational culture, and expectations from superiors or colleagues considerably shape counselors' willingness to engage with digital platforms. This is consistent with recent meta-analytic evidence demonstrating the strong predictive value of SI in educational and library contexts, where social endorsement reinforces legitimacy and reduces uncertainty regarding technology use (Sailer et al., 2024). Likewise, PE plays a vital role, as counselors are more inclined to adopt ICT when they perceive it enhances their professional efficiency, productivity, and overall service quality (Koh et al., 2022). These findings align with earlier work by Venkatesh et al. (2012), reinforcing the relevance of outcome-oriented motivations in educational technology contexts.

In contrast, Facilitating Conditions (FC) showed the lowest AVE value among all constructs, signaling an area of concern. Although technical infrastructure may be nominally available,

school counselors continue to face practical challenges in terms of access to sustained support, reliable connectivity, and institutional readiness. These findings mirror the observations of Al-Emran et al. (2018), who reported that lacking robust infrastructure and responsive technical assistance often becomes a barrier to educational technology adoption in developing contexts. More recent studies have echoed this limitation, underscoring that facilitating conditions must go beyond provision and address usability, accessibility, and scalability to support actual usage (Chiu et al., 2025).

Similarly, the Effort Expectancy (EE) construct revealed moderate influence. Although convergent validity was statistically acceptable, the findings suggest that the perceived complexity of digital platforms may still inhibit full engagement. In particular, teachers with limited digital fluency may experience cognitive overload when using unfamiliar systems. This reinforces the need for intuitive interface design and ongoing digital literacy programs to reduce the entry barrier. Consistent with this, a study by Macedo (2017) on older adult ICT users noted that while EE did not always exert direct influence on behavioral intention, its indirect effect was mediated through constructs like hedonic motivation and perceived usefulness.

The positive contribution of Hedonic Motivation (HM) also merits discussion. Counselors who found ICT tools intellectually stimulating and enjoyable demonstrated greater openness to technology use. This supports the assertion that emotional and experiential dimensions play a central role in technology adoption, particularly in education, where personal engagement can amplify professional commitment. The relationship between perceived enjoyment and behavioral intention has been validated in numerous contexts, including mobile commerce and e-learning platforms (Ramirez et al., 2020; Sudrajat et al., 2024).

Another significant factor is the Habit (H) dimension, which reflects the extent to which counselors have internalized ICT use as part of their routine. Findings from this study show that habitual usage contributes meaningfully to continued engagement with ICT-based guidance services. Limayem et al. (2007) earlier emphasized the role of repetition in forming automatic behaviors around technology. More recent evidence confirms that habitual patterns significantly affect long-term use, especially in sectors where ICT use becomes embedded in daily workflows (Firth et al., 2019; Hsiao et al., 2016; Schlachter et al., 2018).

On the other hand, although Price Value (PV) was not the primary focus in this study, its relevance in the educational sector should not be overlooked. Cost-efficiency remains a critical concern, especially in public education systems with limited budgets. As highlighted a study, that technologies perceived as delivering strong value for investment tend to enjoy higher levels of behavioral intention and satisfaction among educators and stakeholders (Dubey & Sahu, 2021; Rahimizhian et al., 2020).

Importantly, these findings are not only academically relevant but also hold practical implications. Educational policymakers and school leaders can leverage this evidence to inform digital transformation strategies. For instance, interventions aimed at improving technology uptake should not be limited to hardware provision but must also include professional development workshops, peer mentoring programs, and access to technical assistance. Additionally, the integration of engaging and user-friendly platforms will likely enhance both the hedonic and performance-oriented aspects of ICT, further reinforcing behavioral intention.

From a theoretical perspective, the results reaffirm the robustness of the UTAUT2 framework in educational contexts. The model's constructs remain consistent predictors of behavioral intention and technology use, as demonstrated across sectors such as libraries,

mobile commerce, digital banking, and e-learning (Khan & Qutab, 2016; Sitar-Taut & Mican, 2021). Nonetheless, this study offers a localized lens, particularly in the context of Indonesian school-based counseling, where empirical evidence remains scarce. It also highlights nuanced interactions between technological, organizational, and personal factors, suggesting that future UTAUT2-based models may benefit from incorporating moderators such as institutional readiness, digital culture, and user training access.

In conclusion, the present study enriches our understanding of technology acceptance in guidance and counseling through a rigorous application of the UTAUT2 model. Social influence, performance expectancy, and hedonic motivation are key drivers of behavioral intention, while facilitating conditions and effort expectancy present notable challenges. Habit formation reinforces long-term adoption, and value perceptions shape educators' investment justification. Together, these insights provide a comprehensive foundation for designing strategies that promote sustainable, user-centered integration of ICT in school-based counseling services.

4. CONCLUSION

This study investigated the application of the UTAUT2 model to assess technology acceptance in ICT-based guidance and counseling services among school counselors in West Java. The results demonstrated that Social Influence and Performance Expectancy were the most influential predictors of behavioral intention to adopt technology, indicating the importance of peer support, organizational culture, and perceived usefulness in shaping adoption behavior. Conversely, Facilitating Conditions and Effort Expectancy emerged as areas requiring further attention, suggesting that technical infrastructure and ease of use remain key barriers for some users. These findings reinforce the view that technology implementation in educational counseling is not solely a matter of system availability, but deeply intertwined with users' perceptions, social context, and operational readiness.

Based on the findings, several strategic recommendations are proposed to enhance technology acceptance among guidance and counseling professionals. Educational institutions and policymakers should prioritize infrastructure development and ensure the availability of reliable technical support. Continuous professional training must be provided to increase digital competencies, particularly in user-centered platforms. Furthermore, leveraging social dynamics through recognition of digital best practices within schools can enhance positive social norms. The development of interactive and engaging digital tools may also enhance hedonic motivation, further reinforcing usage. Future research is recommended to explore additional factors such as self-efficacy, design quality, and contextual variations across underserved regions, thereby enriching the theoretical and practical contributions of the UTAUT2 model in educational settings.

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