

FAITH MEETS TECHNOLOGY: NAVIGATING STUDENT SATISFACTION IN INDONESIA'S ISLAMIC HIGHER EDUCATION ONLINE LEARNING

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Abstract

As the digital revolution continues to redefine global education, Islamic Higher Education (IHE) institutions in Indonesia face the dual challenge of integrating modern technology with traditional religious instruction. This study explores how digital learning environments can harmonize with Islamic pedagogical values to shape student satisfaction in online learning. Guided by Albert Bandura's social cognitive theory, this research investigates the psychosocial and contextual factors influencing satisfaction and perceived learning outcomes among students in faith-based online education. A total of 3,270 undergraduate students from four IHE institutions participated in this study. Using Structural Equation Modeling-Partial Least Squares (SEM-PLS), we developed a novel integrative model that incorporates conventional online learning dimensions—such as teacher support, content adaptability, student interaction, and perceived ease of use—alongside embedded Islamic values. The analysis reveals that Islamic values are the most dominant factor influencing student satisfaction, surpassing even technological usability. Teacher support significantly enhances metacognitive skills, reinforces faith-based values, and increases overall satisfaction. Additionally, the availability of virtual laboratory resources and adaptive content was found to moderate the relationship between psychosocial factors and learning outcomes. This research contributes a faith-integrated theoretical framework for understanding online learning in religious educational settings, a relatively underexplored domain. It explains 72.8% of the variance in student satisfaction, offering robust insights for curriculum designers, educators, and policymakers aiming to optimize Islamic online education. The study opens new pathways for cross-cultural research at the intersection of technology, pedagogy, and religious values in digital learning environments.

Keywords: Islamic Value, Large Survey, Online Learning, Satisfaction, Social Cognitive



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INTRODUCTION

The global landscape of education is undergoing a profound transformation. The traditional “brick-and-mortar” classroom, long regarded as the cornerstone of formal learning, now faces sweeping disruptions brought about by advancements in information and communication technology (ICT) (Batdi et al., 2021; Nguyen & Tuamsuk, 2022; Feriati et al., 2025). This ongoing digital revolution has been further accelerated by the COVID-19 pandemic, which forced educational institutions—particularly in developing nations—to rapidly adopt online learning as an alternative mode of instruction (Maheshwari, 2021; Pham & Ho, 2020; Toquero, 2020; Firdaus & Mukhtar, 2025; Hermanto et al., 2025). Evidence of this digital shift is clear. According to data from the National Research Council (2015), student participation in online learning has significantly increased, especially among individuals aged 14 to 24. Global enrollment in online education is projected to rise by 44.15% between 2015 and 2026, a trend that closely mirrors the growth of global internet penetration (Nguyen & Tuamsuk, 2022). As online education becomes a fixture of the modern academic experience, the focus now turns toward understanding its effectiveness and long-term sustainability.

Online learning, defined as educational instruction delivered partly or entirely through the internet, offers distinct advantages: flexibility, accessibility, and cost-efficiency (Yu, 2022; Rachmanto & Akande, 2024; Zakiyah et al., 2024; Anugradia et al., 2025). These attributes have sparked widespread debate about its capacity to democratize education, making learning accessible to a broader and more diverse population (Landrum et al., 2021; Habibi et al., 2024; Halimah et al., 2024; Mardiaty et al., 2024). Particularly in times of economic uncertainty, online learning offers a cost-effective solution for institutions and students alike (Coussement et al., 2020; Simbolon et al., 2025). The prospect of “anytime, anywhere, any pace” learning is no longer aspirational—it is becoming the norm in many educational contexts. However, with these opportunities come critical questions. Chief among them is the issue of student satisfaction—a key metric for evaluating the quality and impact of online education (Parahoo et al., 2016; Alqurashi, 2019; Sari et al., 2023; Yohanie et al., 2023; Miharja et al., 2024). Student satisfaction encapsulates learners’ perceptions of value, engagement, and overall experience with virtual instruction. In online learning environments, where face-to-face interaction is limited or entirely absent, understanding what drives satisfaction becomes even more crucial.

This issue takes on even greater complexity within the context of Islamic Higher Education (IHE) institutions. These institutions are uniquely tasked with delivering not only academic instruction but also cultivating student character and spirituality grounded in Islamic values. The digital transition presents both opportunities and tensions: How can IHE maintain their commitment to holistic, value-based education within a virtual platform that inherently lacks the interpersonal intimacy and mentorship traditionally associated with character formation? IHE institutions must now navigate uncharted territory, seeking to balance technological efficiency with spiritual and moral development. Yet, most existing studies on online learning have centered on secular institutions, with a strong focus on infrastructure, content delivery, or general student engagement. There is a clear lack of research that specifically addresses student satisfaction within Islamic higher education frameworks, where the integration of values, culture, and religion into the digital learning experience is a distinctive and vital component.

Although many studies have investigated online learning satisfaction, few have explored it within the context of value-based education systems such as Islamic Higher Education. Prior research tends to focus on technological infrastructure, user-interface design, or general learner engagement, often neglecting the unique intersection of religious values, character development, and educational quality. In particular, there is limited empirical evidence on how affective, metacognitive, social, and technical factors—when interwoven with Islamic principles—shape student satisfaction in virtual environments. Moreover, the existing literature lacks comprehensive theoretical modeling to explain the interplay among these dimensions. While Social Cognitive Theory (Bandura, 2001) has been applied broadly in educational contexts, its application in studying satisfaction within religiously affiliated institutions remains underexplored. This presents a significant gap in understanding how learners in IHE settings cognitively and socially construct their satisfaction with online education.

This study aims to address this critical gap by investigating the multifaceted factors influencing student satisfaction with online learning in Islamic Higher Education institutions. Using Social Cognitive Theory as a conceptual framework, this research develops a comprehensive structural model that examines how various elements—technical functionality, instructional content, social interaction,

metacognitive regulation, emotional engagement, and Islamic values—contribute to student experiences. By employing a mixed-methods approach, this study seeks to not only quantify the relative importance of these factors but also to explore how they interact within the unique cultural and religious context of IHE. The findings are expected to have significant implications for policymakers, instructional designers, and educational leaders in creating digital learning environments that are engaging, inclusive, and aligned with institutional values.

Social Cognitive Theory

Albert Bandura's Social Cognitive Theory, introduced in 1986, provides a profound explanation of human functioning by positing a triadic reciprocity between environmental (E), personal (P), and behavioral (B) elements. The theory explains how students' learning is influenced by the dynamic interaction of their learning environment, personal qualities, and behavior. The theory's central tenet is human agency, which sees humans as active agents in their development. Bandura says that a person's thoughts, beliefs, and experiences directly impact their actions. The theory highlights that the three components' influence is not necessarily equal; in some cases, one factor may have a more significant impact. This insight opens the door to a more student-centered approach to education, supporting the creation of learning strategies that focus on individual agency strengths while accounting for environmental and behavioral influences.

The primary contribution of Social Cognitive Theory to learning is its emphasis on the process of students' knowledge acquisition and construction, which is heavily influenced by social and personal contexts. Social contexts involve interactions with teachers, peers, and parents, while personal contexts include cognition, motivation, and self-efficacy. The concept of triadic reciprocity emphasizes the reciprocal relationship between the environment, personal factors, and behavior in learning. For example, a supportive learning environment can increase student motivation, while students with high self-efficacy tend to create more conducive learning environments. This understanding has important implications for educational practice, including designing learning environments, developing instructional strategies, and holistic assessment. The theory recognizes the complexity of the interactions between students, their environments, and learning behaviors, encouraging a more dynamic approach to education. Thus, Social Cognitive Theory offers a comprehensive framework for understanding and improving the learning process, paving the way for more effective, student-centered teaching methods.

Online Learning Environment

Integrating technology into the learning environment will cause changes in learning practices by changing the physical context, instructional methods, and the roles of teachers and students. This difference occurs due to differences in interaction patterns in online learning (Çebi & Güyer, 2020). According to Khine and Fisher (2003), there are three types of interaction patterns in online learning: one-to-one, one-to-many, and many-to-many. *One-to-one communication* can be defined as a form of activity carried out by providing feedback to students via electronic mail or other online media. Meanwhile, one-to-many communication describes a form of activity in which the teacher guides and facilitates learning by using learning media, teaching materials, and other learning resources. The final type of interaction that occurs is many-to-many. Many-to-many interactions describe discussion activities that take place between students and students and between students and teachers through collaboration and cooperation. These discussion activities promote an effective and diverse learning environment. According to Maheshwari (2021), educators and universities should evaluate how students perceive psychosocial aspects of the online learning environment, such as learning design, delivery, and evaluation in order to provide a rich learning experience for them.

Researchers from different fields are striving to improve student's learning experiences online. One aspect of concern is analyzing students' perceptions of the online learning environment by developing various measurement instruments (Aldridge & Fraser, 2008; Baker, 2007; Maor & Fraser, 2005; Walker, 2020, etc.). Most online learning environment instruments are created by adapting traditional learning environment instruments by adding new factors to illustrate the unique features of the online learning environment. For example, Newhouse (2001) constructed the New Classroom Environment Inventory (NCEI) to determine how students perceive using portable computers in conventional classrooms. The NCEI was modified from the Classroom Environment Scale instrument (Fraser, 1998) by adding six social dimensions highlighting teacher-student interaction. The six social

dimensions are engagement, affiliation, teacher support, group work, regularity, and organization. Meanwhile, researchers in the field of science reconstructed the WIHIC questionnaire (B. Fraser et al., 1996) to be suitable for use in a technology-rich and science-focused learning environment (Gupta & Fisher, 2012; Koul et al., 2011; Oncu & Cakir, 2011) by developing the Technology-Rich Outcomes-Focused Learning Environment Inventory (TROFLEI). Five of the seven dimensions in the TROFLEI instrument relate to the social aspects of learning. TROFLEI is updated with three new factors: differentiation in the cognitive dimension, ethos in the metacognitive dimension, and computer use in the technical dimension. Another instrument is The Distance Education Learning Environments Survey (DELES). DELES consists of six factors, and some are adapted from previously developed learning environment instruments (Ferrer-Cascales et al., 2011). The instrument has been translated into several languages, including Mandarin, Turkish, and Arabic (source).

Most current literature pays particular attention to the online learning environment's technical, social, and cognitive aspects (Chang et al., 2015; Firmansyah et al., 2024; Castro, 2025; Laksono et al., 2025; Qiu et al., 2025). As example, Parahoo et al. (2016) found that university reputation, faculty commitment to providing teaching and learning services, and student-student interaction significantly impact satisfaction with online learning. In the same vein, Weidlich and Bastiaens (2019) showed that socio-emotional aspects (staff friendliness, social interaction, social presence, social space) affect student satisfaction and retention in online learning. This evidence shows the need to understand students' perceptions of online learning by adding metacognitive and affective dimensions to the learning environment instruments. Metacognition refers to the student's ability to organize knowledge, assess the difficulty of a problem, observe the level of self-understanding, as well as assess the progress of self-study (Akturk & Sahin, 2011; Acquah, 2025; Galdonez, 2025; Tep et al., 2025). Vovides et al. (2007) point out that students with high metacognitive abilities can self-regulate and repeat certain content items when their perceived level of understanding falls below the desired level. Students who self-regulate can use metacognitive control to assess their learning progress and adjust information processing to meet their goals.

This study explores the structural model of the relationship between various dimensions of the online learning environment with student satisfaction with the online learning environment in the context of Islamic religious universities in Indonesia. Moreover, implementing online lectures at IHE during the COVID-19 pandemic was a sudden transformation because, previously, online lectures had never been held. Therefore, psychosocial factors from the online learning environment at PTKI must be analyzed in depth through student perceptions. This study explores the structural model of the relationship between various dimensions of the online learning environment with student satisfaction with the online learning environment in the context of Islamic religious universities in Indonesia.

Students' Satisfaction in Online Learning

The concept of satisfaction first appeared in studies in the field of psychology, then gradually developed into other fields. Cardozo (1965) used the term customer satisfaction in marketing for the first time. Referring to Cardozo (1965), customer satisfaction is central to marketing. Lexically, *satisfaction* is defined as the level of pleasure the individual feels, which comes from their perception of the product's features and their expectations of the product (source). Given that higher education is an institution that provides educational services to students, the definition of satisfaction is expanded in the context of the university. The desired business imperatives of Higher Education, such as loyalty, have been shown to have an impact on the quality of the academic experience leading to student satisfaction (Kuo et al., 2013; Parahoo et al., 2016; Doranggi & Rizka, 2025; Em et al., 2025; Mabeza, 2025; Sari & Oransa, 2025). Thus satisfaction is an exogenous variable of the research model. The specific factors that influence student satisfaction with online learning have been investigated by researchers. According to Kosiba et al. (2022), the quality of social interaction influences student satisfaction in online learning. Elshami et al. (2021), on the other hand, stated that study load and workload, active student involvement, and technical issues related to the use of learning support technologies all affect student and faculty satisfaction in online learning. According to Alqurashi (2019), social interaction (teacher-student, student-student, student-content) is the most important predictor of student satisfaction in online learning. According to Horzum (2017), the variable social presence (social presence) is the most important factor determining student satisfaction in online learning.

RESEARCH METHOD

Authors developed a self-report instrument to measure students' perceptions and satisfaction with online learning. The construction of the instrument is taken from previous studies on the learning environment and student satisfaction with online learning and modified based on the context of learning at Islamic Religious Universities. For example, the technical aspects of an online learning environment (ease of use, online communicating and laboratory availability) were selected from the Constructivist Online Learning environment Survey (COLLES) instruments (Yeo et al., 2006), and the Technology-Rich-Outcomes-Focused Learning Environment Inventory (TROFLEI) (Koul et al., 2011). The social aspects of online learning were adapted from the What is Happening in this Class (WIHIC) questionnaire developed by MacLeod and Fraser (2010). Furthermore, the content aspect (adaptive content) was selected from the Distance Education Learning Environment Survey (DELES) (S. L. Walker & Fraser, 2005). Cognitive and metacognitive dimensions are adopted from the instruments TROFLEI (Gupta and Fisher, 2012) and The Motivated Strategies for Learning Questionnaire (MSLQ) (Pintrich et al., 1991). In this study, researchers modified the research instrument by adding a dimension of Islamic Values that measures the extent to which the online learning environment encourages students to implement Islamic values in learning and daily life. According to Hassan et al. (2010), from an axiological point of view, social problems that arise among teenagers today are caused by a lack of awareness and reluctance toward Islamic teachings. Hassan et al. (2010) further emphasized that the global economic crisis that has destroyed many lives did not start with the sudden colossal actions of a handful of people but instead is rooted in our collective mistakes, both small and big, where lying, cheating, and maximizing profits to personal gain is not considered a sign of ethical failure, but rather a sign of one's intelligence and success. Therefore, integrating Islamic Values into learning is an effective method to produce whole human beings who are healthy at all levels (physical, mental, emotional, and spiritual).

As many as 3,270 undergraduate students from four Islamic Religious Colleges in Indonesia became research respondents. Filling out the questionnaire is done online using the Google form. Research participants are students who have attended online learning for at least one semester. Furthermore, the data were analyzed using a variance-based structural equation modeling technique (SEM-PLS). Referring to Hair Jr et al. (2021), SEM is a multivariate data analysis that can be used simultaneously to measure the reliability and validity of research variable measurement instruments and estimate the relationship between these variables. The relationship model in this study can be explained as follows:

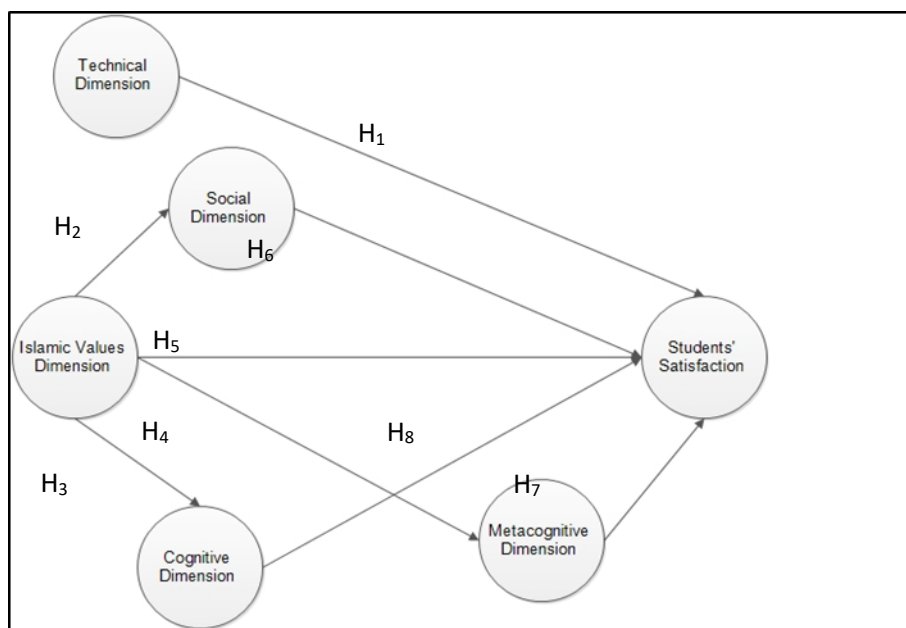


Figure 1. Relationship Model of Online Learning Environment and Student Satisfaction

The hypothesis proposed is as follows:

H₁ : Technical dimensions (communicating online, perceived ease of use, and laboratory availability) positively affect student satisfaction in online learning.

H₂ : Islamic value positively affects the social dimension of students in online learning.

H₃ : Islamic value positively affects the cognitive dimension of students in online learning.

H₄ : Islamic value positively affects the metacognitive dimension of students in online learning.

H₅ : The social dimension (teacher support, collaboration and interaction between students) positively affects student satisfaction in online learning.

H₆ : The social dimension (teacher support, collaboration and interaction between students) positively affects student satisfaction in online learning.

H₇ : The metacognitive dimension positively affects student satisfaction in online learning.

H₈ : The cognitive dimension positively affects student satisfaction in online learning

RESULTS AND DISCUSSION

The variance-based partial least square (PLS-SEM) method was employed for data analysis in this study. The PLS-SEM analysis process is systematically divided into two main stages: evaluation of the measurement model and evaluation of the structural model (Hair Jr et al., 2021). The evaluation of the measurement model, also known as the outer model, aims to specify the relationship between latent variables and their indicators. This stage involves instrument validity testing, which encompasses both convergent and discriminant validity. The second stage of PLS-SEM analysis involves evaluating the structural model, or inner model, which assesses the proposed model by measuring the significance of relationships between latent construct. This evaluation primarily relies on path coefficients, which describe the strength of relationship between latent construct.

Reflective Measurement Model Analysis

The initial stage of PLS-SEM data analysis involves testing the measurement model through convergent and discriminant validity assessments. Convergent validity is evaluated using three key metrics: loading factor, composite reliability (CR), and average variance extracted (AVE). The loading factor, which should be ≥ 0.7 (Hair Jr et al., 2021), indicates the correlation between each item and its construct; a low value suggests a weak relationship between the indicator and the latent variable construct. Composite reliability measures internal consistency and should exceed 0.6. The AVE value, which should be ≥ 0.5 , quantifies the variance in indicator variables explained by the latent construct; a higher AVE indicates a better representation of the latent construct by its manifest variables. Discriminant validity for the reflective model is assessed through cross-loading and the Fornell-Larcker criterion. It compares an indicator's loading with its associated construct to other constructs and evaluates the square root of each construct's AVE against its correlations with other constructs. The study's results demonstrated robust measurement model validity: all instrument items achieved loading factor values ≥ 0.7 , CR values ranged from 0.872 to 0.965 and AVE values fell between 0.585 and 0.820. These findings, as presented in Table 1, provide strong evidence for reliability and validity of the measurement model, with high loading factors indicating strong indicator construct relationships, CR values demonstrating excellent internal consistency, and AVE values confirming that each latent variable explain a substantial portion of its indicator's variance, thus establishing a solid foundation for subsequent structural model evaluation and hypothesis testing in the PLS-SEM analysis process.

Table 1. Loading Factor, Composite Reliability, and AVE Instrument

Latent Variable	Item	Loading Factor	Composite Reliability	Average Variance Extracted (AVE)
Adaptive Content (AC)	AC1	0.878	0.952	0.740
	AC2	0.891		
	AC3	0.886		
	AC4	0.815		
	AC5	0.848		
	AC6	0.863		
	AC7	0.837		
Lab Availability	LA1	0.745	0.950	0.728
	LA2	0.832		
	LA3	0.800		
	LA4	0.936		
	LA5	0.814		
	LA6	0.700		
	LA7	0.798		
Communicating Online (C)	C1	0.826	0.872	0.695
	C2	0.861		
	C3	0.813		
Teacher Support	DD1	0.752	0.933	0.700
	DD2	0.844		
	DD3	0.838		
	DD4	0.916		
	DD5	0.877		
	DD6	0.782		
Student-Student Interaction	IM1	0.751	0.894	0.585
	IM2	0.838		
	IM3	0.792		
	IM4	0.749		
	IM5	0.749		
	IM6	0.653		
Islamic Value	IV1	0.779	0.913	0.636
	IV2	0.831		
	IV3	0.868		
	IV4	0.824		
	IV5	0.744		
	IV6	0.730		
Metacognitive	MC1	0.778	0.915	0.642
	MC2	0.832		
	MC3	0.793		
	MC4	0.835		
	MC5	0.808		
	MC6	0.761		
Perceive Ease of Use	P1	0.790	0.899	0.609
	P2	0.832		
	P3	0.870		
	P4	0.842		
	P5	0.852		
Student Satisfaction	SF1	0.811	0.927	0.678
	SF2	0.890		
	SF3	0.866		
	SF4	0.764		
	SF5	0.778		
	SF6	0.826		

Based on Table 1, all loading factors values ≥ 0.70 , so it can be inferred the validity of the online learning environment instrument developed both at the item level. Furthermore, at the construction level, the composite reliability value is high with values ranging from 0.872 – 0.965. Referring to Hulland (1999), the composite reliability limit value is equal to the Cronbach Alpha value ≥ 0.700 . The higher the composite reliability value, the higher the contribution of the construct in the measurement model. The final criterion of convergent validity is the measurement of average variance extracted (AVE) for each construct. The AVE value describes the variance or variability of manifest variables that a latent construct can have. Hair Jr et al. (2021) recommends an AVE value of at least 0.5 to indicate an excellent measure of convergent validity. From Table 1, it can be seen that the AVE values for all latent variables are above the minimum values with a range of values 0.585 – 0.820. So, based on the values of loading factor, composite reliability, and AVE, it can be concluded that learning environment instruments have good convergence validity. Discriminant validity measures the extent to which the construction of latent variables differs empirically. The table shows that the square root of the AVE for each construct is greater than the correlation between the constructs.

Table 2. Discriminant Validity

	Adaptive content	Islamic Value	Lab. Availability	Metacognitive	Perceived Ease of Use	Student Interaction	Student Satisfaction	Teacher Support
Adaptive content	0.860							
Islamic Value	0.744	0.797						
Lab. Availability	0.775	0.678	0.908					
Metacognitive	0.787	0.740	0.719	0.783				
Perceived Ease of Use	0.775	0.676	0.586	0.743	0.849			
Student Interaction	0.646	0.726	0.572	0.774	0.800	0.793		
Student Satisfaction	0.740	0.807	0.655	0.754	0.669	0.704	0.824	
Teacher Support	0.584	0.658	0.561	0.676	0.579	0.687	0.562	0.814

Structural Model Analysis (Hypothesis Test)

After analyzing the latent variable construct measurement model, the next stage is to evaluate the structural model or inner model. The first step is to analyze the structural model by looking at the significance of the relationship between latent variables. The significance of the relationship between latent variables can be seen from the value of the path coefficient that describes the strength of the relationship between constructs. The sign or direction of the path must correlate with the hypothesized model, the significance of which can be assessed by a t-test score. Referring to (source), the t-test value ≥ 1.96 or the p-value value < 0.05 indicates a relationship between significant variables. In this study, the authors found that all pathways of relationships between latent variables in the proposed model had a t-test value of ≥ 1.96 (Table 2). These results provide support for the model we are proposing. The next step is to evaluate the value of R^2 . The value of R^2 is one of the indicators determining the strength of the predictive model (source). The R^2 value is used to analyze how much influence exogenous latent variables have on endogenous latent variables. Referring Hair Jr et al. (2017) to there are three categories of grouping R^2 values, namely strong, moderate, and weak. Hair et al (2011) stated that the R^2 value of 0.75 belongs to the strong category, the R^2 value of 0.50 belongs to the moderate category, and the R^2 value of 0.25 belongs to the weak category. In this study, the results of the inner model analysis showed that the model explained 72.8% variance in student learning satisfaction in the online learning environment and fell into the strong category. Similarly, 56.8% variance in the Islamic value dimension and 61.6% variance in the metacognitive dimension are explained by the construction of related learning environment dimensions. Table 3 summarizes the direct, indirect, and total effects of the PLS-SEM bootstrapping process.

Table 3. Standardized causal effects dari proses bootstrapping PLS-SEM

Dependent	Independent	Standardized Causal Effect			
		Direct	Indirect	Total	T-Statistic
Metacognitive	Islamic Value	0.520		0.520	6.188
	Teacher Support	0.334	0.157	0.491	6.206
Islamic Value	Teacher support	0.303		0.303	2.960
	Student interaction	0.518		0.518	5.440
	Adaptive content	0.229		0.229	3.717
	Islamic value	0.464	0.111	0.575	4.203
Student Satisfaction	Laboratorium	0.128		0.128	3.693
	Availability				
	Teacher Support	0.315		0.315	3.804
	Student Interaction	0.168	0.298	0.466	3.393
	Metacognitive	0.213		0.213	1.171
	Perceived Ease of Use	0.422		0.422	5.203

Designing and delivering learning experiences that incorporate psychosocial factors is increasingly recognized as essential for enhancing student engagement, satisfaction, and retention in higher education. This study introduces a novel and contextually relevant model that integrates Islamic values and metacognitive factors into the online learning environment at Islamic Higher Education (IHE) institutions. The findings offer strong empirical support for the proposed model, with the structural model explaining 72.6% of the variance in student satisfaction and perceived learning. This demonstrates the model’s robust explanatory power and underscores the critical role of Islamic values, metacognitive skills, adaptive content, laboratory availability, teacher support, student interaction, and perceived ease of use in promoting a successful online learning experience.

A key novel contribution of this research is its empirical validation of Islamic values as the most significant predictor of student satisfaction in online learning—an area rarely addressed in mainstream educational technology studies. This finding reinforces the conceptual model proposed by Musbahtiti et al. (2013), which highlighted the necessity of aligning online learning frameworks with Islamic ethics to address unique challenges such as academic dishonesty, reduced interpersonal accountability, and lack of moral engagement in virtual environments. The results confirm that embedding Islamic principles into the digital learning infrastructure does more than ensure religious relevance—it fosters a learning ecosystem characterized by integrity, accountability, and self-discipline. These values resonate deeply with learners' cultural and spiritual identities, enhancing both the affective and cognitive dimensions of their educational experience.

Additionally, the study reveals a strong predictive relationship between Islamic values and students’ metacognitive skills ($R^2 = 61\%$). This confirms previous findings by Yusoff (2021), who emphasized that the Qur’an, as a primary source of moral and intellectual guidance, provides a foundational framework for nurturing reflective, attentive, and intentional thinking. Integrating Qur’anic values into pedagogy encourages students to engage in deeper cognitive processing, critical evaluation, and self-regulation—hallmarks of metacognitive competence. This adds to the growing literature suggesting that spirituality and metacognition are not mutually exclusive but may, in fact, reinforce each other when properly contextualized.

Teacher support also emerged as a significant driver of metacognitive development, Islamic value internalization, and overall student satisfaction. In the context of online learning, teachers act as both academic guides and moral role models. Their encouragement, feedback, and ethical modeling shape students’ cognitive behavior and moral orientation. As Al-Ghazali (2013) emphasized, teachers in the Islamic tradition are entrusted with responsibilities that extend beyond knowledge transmission; they must model compassion, ethics, humility, and sincerity. Embedding these traits in online instructional design—especially through active discussion forums, personal mentorship, and ethical discourse—can strengthen learners’ connection to both academic content and spiritual growth.

Implications of this study are far-reaching for educational practitioners and policymakers within IHE and beyond. First, the results advocate for a culturally responsive instructional model that incorporates spiritual and ethical values as core pedagogical elements, especially in online settings where traditional mechanisms of community and moral oversight are diminished. Second, it supports

the need for professional development programs that train educators not only in digital pedagogy but also in character-based instruction aligned with Islamic teachings. Third, this research invites curriculum designers to embed metacognitive training directly into course content, leveraging both secular strategies (e.g., reflection prompts, self-assessment tools) and religious teachings that promote intellectual engagement.

However, several limitations must be acknowledged. The study is based on self-reported data, which may be influenced by social desirability bias, especially when dealing with religious or moral constructs. The model was tested in a specific cultural and institutional context, limiting its generalizability to non-Islamic or secular learning environments. Furthermore, while the model demonstrates high explanatory power, it does not account for other potential mediators or moderators such as socio-economic background, prior academic achievement, or digital literacy levels. The cross-sectional nature of the study also precludes causal inferences.

Based on these limitations, the following recommendations are proposed for future research and practice: Longitudinal studies should be conducted to examine the long-term effects of integrating Islamic values and metacognitive training on learning outcomes and ethical behavior. Mixed-method approaches, including qualitative interviews or ethnographic methods, can provide deeper insights into how students interpret and embody these values in their learning practices. Comparative studies across different religious or cultural settings could explore whether similar models can be adapted in other faith-based institutions, thereby expanding the global discourse on values-based online education. Policy initiatives should support the development of integrated IT infrastructure that not only delivers content but also monitors, evaluates, and promotes ethical behavior in virtual learning environments.

CONCLUSION

This study successfully developed and empirically validated a model of student satisfaction in online learning within Islamic Higher Education (IHE). The findings reveal that Islamic values are the most critical factor influencing student satisfaction, followed by perceived ease of use, teacher support, adaptive content, metacognitive skills, student interaction, and laboratory availability. These results highlight that in the context of faith-based institutions, the integration of spiritual values with the technical and pedagogical quality of online learning plays a vital role in shaping students' positive learning experiences. Given these findings, IHE management should design targeted strategies to enhance student satisfaction by strengthening the spiritual dimension of their educational services, improving the accessibility and usability of digital platforms, ensuring consistent and empathetic teacher support, and offering interactive and adaptive content that meets students' academic and personal development needs. The implications extend beyond satisfaction alone, as higher satisfaction contributes to improved student engagement, academic performance, institutional trust, and long-term loyalty. This reinforces the importance of aligning online learning environments with students' cultural and religious expectations, especially in Islamic educational settings. However, the study is not without limitations. The model was tested using data from a relatively small sample within a single country—Indonesia—limiting the generalizability of the results to other cultural or institutional contexts. Future research should include larger, more diverse samples across various regions to validate and refine the model further. Additionally, as the data were collected through self-report instruments, there is a risk of subjective bias or social desirability effects, which should be considered when interpreting the results. The cross-sectional nature of the study also means it only captures a snapshot of student satisfaction at a specific point in time and does not reflect how satisfaction may evolve over the course of students' academic journeys. Implications of this research point to the need for a more holistic and adaptive approach in managing online education in IHE. Rather than focusing solely on digital infrastructure or content delivery, institutions must take into account the emotional, cognitive, and spiritual dimensions of the learning experience. This includes building an online learning culture that promotes student autonomy, fosters meaningful interaction, and nurtures values-based learning. Future studies are encouraged to adopt longitudinal designs to explore changes in student satisfaction over time and examine additional influencing factors, such as family support, socioeconomic conditions, digital access, and institutional services. Such efforts will provide a more complete picture of how student satisfaction in online Islamic education can be effectively supported and sustained.

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AUTHOR CONTRIBUTIONS

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CONFLICTS OF INTEREST

The author(s) declare no conflict of interest.

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