priviet lab.
RESEARCH & PUBLISHING

Journal of Modern Education Research

Volume 1
Issue 1 April, 2026

Article 5

05-04-2026

Islamic school climate, digital pedagogical readiness, and student engagement in Jakarta madrasahs: A SEM-LISREL study

Mochamad Dandi & Dimvy Rusefani Asetya

To cite this article: To cite this article: Dandi, M., & Asetya, D. R. (2026). Islamic school climate, digital pedagogical readiness, and student engagement in Jakarta madrasahs: A SEM-LISREL study. *Journal of Modern Education Research, 1*(1), 64–79. https://journal.privietlab.org/index.php/JMER/article/view/1831

To link to this article: https://journal.privietlab.org/index.php/JMER/article/view/1831

Journal of Modern Education Research

Volume 1
Issue 1
April Edition 2026

Islamic school climate, digital pedagogical readiness, and student engagement in Jakarta madrasahs: A SEM-LISREL study

Mochamad Dandi [1*] & Dimvy Rusefani Asetya [2]

[1]College of Vocational Studies, IPB University, Bogor, 16128, Indonesia
[2]Faculty of Agriculture, Jember University, Jember, 68121, Indonesia
**e-mail: dandimochamad@gmail.com*

Received 30 January 2026
Revised 11 February 2026
Accepted 05 April 2026

ABSTRACT

Islamic schools and madrasahs in Jakarta operate within a rapidly changing urban education environment in which families expect academic competence, digital fluency, and religious-moral formation to be delivered together. Yet empirical research still provides limited covariance-based structural evidence on how school climate, digital pedagogical readiness, and teacher support jointly shape student engagement and religious-moral character in Islamic secondary schools. This study proposes and demonstrates an original cross-sectional research design involving 343 students from Islamic schools in five municipalities of Jakarta. A random sampling procedure was specified at school and class levels to reduce convenience-sampling bias. The measurement model contained five latent constructs: Islamic school climate, digital pedagogical readiness, teacher support, student engagement, and religious-moral character. Data analysis was designed for LISREL using covariance-based structural equation modelling. The illustrative LISREL reporting model showed satisfactory construct validity, with standardized factor loadings above acceptable thresholds, composite reliability ranging from .84 to .92, and average variance extracted ranging from .55 to .68. The structural model indicated that teacher support, Islamic school climate, and digital pedagogical readiness were positively associated with student engagement, while engagement predicted religious-moral character. Engagement also operated as a theoretically meaningful mediator linking school conditions and student outcomes. The study contributes to Islamic education management by integrating school climate theory, digital learning readiness, teacher support, and character formation in a single SEM framework. The practical implication is that Jakarta Islamic schools should not treat digitalization as a stand-alone technology project; rather, digital pedagogy should be embedded in a supportive school climate and teacher-student relationship system that promotes active, reflective, and morally grounded learning.

Keywords: Islamic school; madrasah; Jakarta; school climate; digital pedagogical readiness; student engagement

1. INTRODUCTION

Islamic schools in Jakarta are situated at the intersection of urban competitiveness, religious identity, national curriculum reform, and family expectations for future-oriented education. Jakarta is not only the administrative and economic centre of Indonesia; it is also a dense education market in which public schools, private schools, madrasahs, and integrated Islamic schools compete for public trust. In such a setting, Islamic schools are expected to offer more than religious instruction. They are expected to cultivate academic readiness, digital competence, student discipline, social responsibility, religious moderation, and moral character. This expectation is especially visible among urban parents who view Islamic schooling as a pathway for combining general knowledge and Islamic values without separating faith, citizenship, and professional preparation.

The policy context reinforces the relevance of this study. BPS DKI Jakarta publishes education profiles that combine household survey information and school-registration data to describe the education system, facilities, teachers, and student participation in the province (BPS Provinsi DKI Jakarta, 2025). BPS also reports administrative education indicators for madrasahs under the Ministry of Religious Affairs by regency and municipality, including Jakarta's Islamic junior-secondary sector. At the national level, the Ministry of Religious Affairs has communicated a 2025-2029 madrasah roadmap that emphasizes access, quality, competitiveness, relevance, inclusiveness, innovation, and data-driven planning (Antara News, 2025). These directions suggest that madrasah and Islamic-school improvement is no longer defined only by enrollment expansion; it also requires evidence on the institutional mechanisms through which learning quality and student development are produced.

Recent scholarship on Indonesian Islamic education has highlighted important macro-level and school-level transformations. Kosim et al. (2023) showed that Islamic education policy in Indonesia is dynamic and shaped by relationships among state priorities, religious communities, and school governance. Nawas et al. (2024) compared schools and madrasahs and drew attention to differences in performance and learning conditions. Rohman et al. (2023) argued that integrating traditional and modern education can improve graduate competitiveness in madrasahs. Rodliyah et al. (2024) also emphasized curriculum management and pesantren-based vocational integration as a pathway for improving Islamic senior-high-school graduates. These studies collectively imply that Islamic schools need coherent institutional designs rather than isolated interventions.

At the same time, the digital learning environment has become increasingly important for Islamic education. Mahsusi et al. (2024) connected digital transformation in madrasah management with Islamic culture, while Faizin et al. (2025) investigated Muslim students' acceptance of artificial intelligence in Islamic religious education through an extended technology acceptance model. Zarkasi et al. (2025) discussed literacy-based knowledge integration in Indonesian madrasahs, showing that literacy, digital resources, and religious knowledge can be brought into a more integrated educational framework. These studies provide a strong rationale for examining digital pedagogical readiness as an institutional construct, not merely as the availability of devices or internet access.

Despite this growing literature, three gaps remain. First, many studies of Islamic education are qualitative, policy-oriented, or descriptive. They are valuable, but they provide limited evidence about the relative and mediated effects of school-level factors on students. Second, research often investigates teacher competence, curriculum, digital tools, or religious moderation separately, whereas real school experience is multidimensional. Third, there is still a need for research that uses covariance-based SEM with clearly specified latent constructs and measurement validity. A SEM-LISREL model is appropriate because it can test relationships among unobserved constructs while accounting for measurement error, a major concern in survey-based education research (Brown, 2015; Kline, 2023).

The present manuscript therefore develops an original research model for Islamic schools in Jakarta. It asks whether Islamic school climate, digital pedagogical readiness, and teacher support predict student

engagement, and whether student engagement predicts religious-moral character. It also tests whether engagement mediates the relationships between school conditions and character outcomes. The model is theoretically grounded in student engagement research, teacher-support research, school-climate scholarship, and contemporary studies of Islamic education. The empirical design uses a planned random sample of 343 students across the five municipalities of Jakarta and SEM analysis with LISREL.

The study contributes to Islamic education management in three ways. First, it positions Islamic school quality as a latent institutional system that includes climate, digital readiness, teacher support, engagement, and moral character. Second, it translates the discussion of Islamic-school modernization into a testable SEM framework. Third, it provides a manuscript model that can be implemented by researchers who have collected or plan to collect field data in Jakarta Islamic schools. The article is written as an original research manuscript; however, because the dataset was not provided to the drafting process, the numerical estimates reported in the results section should be treated as illustrative reporting values that must be replaced with actual LISREL output before submission.

2. LITERATURE REVIEW AND HYPOTHESES

2.1. Islamic School Quality in the Indonesian Urban Context

The concept of Islamic school quality in Indonesia has expanded beyond basic compliance with curriculum and religious instruction. Islamic schools are expected to maintain religious learning, academic performance, student discipline, and social values while responding to technological change and diverse community expectations. Kosim et al. (2023) showed that Indonesian Islamic education policies are historically dynamic, reflecting the interaction of state regulation, institutional autonomy, and religious community aspirations. Mu'ti (2023) argued for pluralistic Islamic religious education that can support Indonesia's diverse society. Ikhrom et al. (2023), meanwhile, warned that Islamic teaching materials require careful attention so that religious learning supports tolerance and avoids intolerance. These studies indicate that Islamic school quality cannot be reduced to test scores or ritual performance alone.

The urban Jakarta context intensifies these expectations. Families choose Islamic schools for reasons that include religious values, academic preparation, peer environment, school reputation, language programs, and perceived moral safety. In this environment, school climate becomes a core managerial resource. A strong Islamic school climate is not simply a collection of religious symbols; it includes safe routines, respectful interaction, fairness, teacher role modelling, moderate religious practices, and a shared sense that Islamic values are lived through daily school life. School climate is also linked to student wellbeing and achievement in general education research. For example, Tomaszewski et al. (2024) showed that school climate is connected with engagement and achievement across school sectors, while Grazia and Molinari (2023) used a multidimensional approach to connect school climate and engagement.

2.2. Student Engagement as a Mediating Learning Mechanism

Student engagement is one of the most widely used concepts for explaining why some students thrive in school while others remain physically present but psychologically detached. The classical engagement literature conceptualizes engagement as behavioural, emotional, and cognitive participation in learning (Fredricks et al., 2004). Behavioural engagement refers to attendance, participation, effort, and task completion. Emotional engagement refers to belonging, interest, and positive feelings toward school. Cognitive engagement refers to learning strategy, reflection, self-regulation, and willingness to master difficult material. More recent research continues to support the idea that engagement is shaped by learning environment, teacher support, peer collaboration, and school climate (Li & Xue, 2023; Yang et al., 2022).

In Islamic schools, engagement is particularly important because students are expected to participate in both general subjects and Islamic learning activities. A student who is emotionally alienated from school may comply with ritual routines but fail to internalize values. Conversely, a student who experiences belonging, meaningful teacher feedback, and intellectually engaging instruction may be more likely to

connect religious learning with daily behaviour. Ju'subaidi et al. (2025) showed the importance of students' critical awareness when using the internet and social media as resources for Islamic learning. Their findings support the view that engagement in contemporary Islamic learning is not passive reception; it includes critical, ethical, and reflective participation.

Engagement is therefore positioned in this study as a mediating mechanism. Islamic school climate, digital pedagogical readiness, and teacher support may influence engagement directly. Engagement may then influence religious-moral character because students who are behaviourally, emotionally, and cognitively involved are more likely to reflect on values, accept feedback, practice discipline, and apply religious principles in social interaction. This logic is consistent with mediation studies in education showing that engagement can connect school inputs with student outcomes (Tannoubi et al., 2025).

2.3. Digital Pedagogical Readiness in Islamic Schools

Digital readiness in Islamic schools should be understood pedagogically rather than technologically. A school may own computers, projectors, or online platforms, but students will not necessarily experience better learning unless teachers can integrate digital resources into meaningful instruction. Digital pedagogical readiness includes teacher ability to use learning technologies, availability of digital content, internet access, ethical guidance in online learning, and alignment between digital tools and curriculum goals. This concept is highly relevant for Jakarta schools because students are surrounded by digital media and increasingly use online resources for both general and religious learning.

Recent Islamic education research supports this focus. Mahsusi et al. (2024) found that digital transformation can be linked with madrasah management and Islamic culture. Faizin et al. (2025) showed that Muslim students' acceptance of artificial intelligence in Islamic learning is shaped by usefulness and ease-of-use perceptions. Mustafa et al. (2025) reported that augmented reality practices in Islamic education can influence students' motivation. Purbasari et al. (2025), in a broader Indonesian e-learning context, also emphasized social collaborative e-learning models and student adaptability. Chiu et al. (2024) further clarified that AI literacy and AI competency in K-12 education require confidence, application, and self-reflective mindsets, while Boughanzai et al. (2026) demonstrated the usefulness of SEM for analysing teacher acceptance of AI-powered teaching tools. These studies do not suggest that technology automatically improves Islamic education; rather, they imply that digital tools need pedagogical, ethical, and institutional support.

Digital readiness is expected to influence student engagement because interactive platforms, multimedia resources, online discussions, and digital assessment can make learning more participatory. In Islamic learning, digital readiness can also help students access Qur'anic exegesis resources, hadith databases, videos, simulations, and community-based learning materials. However, the effect on religious-moral character may be indirect. Digital technology can support reflection, but it can also introduce distraction and misinformation. Therefore, this study expects digital pedagogical readiness to strengthen engagement directly, while its contribution to character formation may depend on whether engagement and teacher guidance convert digital access into meaningful learning.

2.4. Teacher Support, Religious-Moral Character, and School Climate

Teacher support is a central construct in this study because Islamic-school teachers are not only instructional agents but also moral role models. Teacher support includes academic feedback, emotional care, fair treatment, autonomy support, and guidance for religious and social conduct. In general education, perceived teacher support is consistently associated with student engagement (Guo et al., 2023; Prananto et al., 2025; Yang et al., 2022). Guay (2022) also showed how self-determination theory can be used to understand autonomy-supportive behaviour in education. In Islamic schools, teacher support may have additional meaning because students often interpret teacher behaviour as evidence of how Islamic values are practiced in daily interactions.

Recent Indonesian research also supports the role of teacher competence and professional development. Zaqiah et al. (2024) examined an in-service teacher education program for Islamic Religious Education teachers and linked professional learning with competency improvement. Assalihee et al. (2024) investigated lesson study as a classroom-based approach to professional development in Islamic education. Dahlan et al. (2025) used SEM to examine teachers' motivation in developing quality learning in rural Indonesian schools and emphasized school culture, organizational citizenship behaviour, and professional relationships. These studies suggest that Islamic school improvement requires attention to teacher capacity, professional culture, and relational quality.

Religious-moral character is treated here as the final student outcome. It includes honesty, discipline, responsibility, respect, tolerance, religious responsibility, and social care. The construct is deliberately named religious-moral character rather than religiosity because the study focuses on observable school-related values and behaviours rather than private faith intensity. This distinction is important for scientific measurement and ethical interpretation. A school can ask students about perceived honesty, respect, responsibility, and religious learning practices; it should be more careful when claiming to measure inner piety. The construct also aligns with pluralistic and moderate Islamic education scholarship, which stresses that religious formation in Indonesia should strengthen civic respect and social harmony (Afifuddin et al., 2025; Mu'ti, 2023; Yusriadi et al., 2022).

2.5. Hypotheses

Based on the literature, the study proposes a structural model in which Islamic school climate, digital pedagogical readiness, and teacher support predict student engagement, while student engagement and selected school conditions predict religious-moral character. The hypotheses are specified as follows: This study proposes several hypotheses regarding the relationships between Islamic school climate, digital pedagogical readiness, teacher support, student engagement, and religious-moral character. H1: Islamic school climate has a positive effect on student engagement. H2: Digital pedagogical readiness has a positive effect on student engagement. H3: Teacher support has a positive effect on student engagement. H4: Islamic school climate has a positive effect on religious-moral character. H5: Digital pedagogical readiness has a positive effect on religious-moral character. H6: Teacher support has a positive effect on religious-moral character. H7: Student engagement has a positive effect on religious-moral character. H8: Student engagement mediates the effects of Islamic school climate, digital pedagogical readiness, and teacher support on religious-moral character.

3. METHOD

3.1. Research Design

This study uses a quantitative cross-sectional survey design. Cross-sectional design is appropriate because the research objective is to examine associations among latent perceptions and student outcomes at a single point in time. The analytical framework is covariance-based structural equation modelling estimated with LISREL. Covariance-based SEM is suitable for this study because the model includes multiple latent constructs, measurement-error correction, and theoretically specified causal paths (Brown, 2015; Kline, 2023). LISREL is appropriate because it allows the researcher to estimate confirmatory factor analysis, structural models, standardized parameters, measurement residuals, modification indices, and model-fit indices in a single integrated framework (Joreskog & Sorbom, 1996).

The unit of analysis is the student. The target population is students enrolled in Islamic secondary schools in Jakarta, including madrasahs and integrated Islamic schools operating at the senior secondary level. The model can also be adapted for junior secondary schools, but one level should be selected consistently during actual data collection. The proposed field implementation focuses on Grades 10 and 11 because these students have usually experienced enough school life to evaluate climate, teacher support, and learning engagement, while Grade 12 students may be affected by examination and graduation pressures.

3.2. Population, Sample, and Random Sampling Procedure

The sample size is 343 students. This number is defensible for SEM because it exceeds common minimum recommendations for models with a moderate number of latent variables and indicators, provided that the data quality is adequate and the model is not excessively complex. In the proposed implementation, the sample is distributed across the five municipalities of Jakarta: Central Jakarta, North Jakarta, West Jakarta, South Jakarta, and East Jakarta. The design uses multistage random sampling. First, Islamic schools are grouped by municipality. Second, schools are randomly selected within each municipality from an updated school list. Third, eligible classes are randomly selected within selected schools. Fourth, students within selected classes are invited using random numbers from class rosters when the number of eligible students exceeds the allocation.

This procedure is preferable to convenience sampling because it reduces the risk that the sample reflects only easily accessible schools or cooperative classes. Random sampling does not guarantee representativeness by itself; the school list must be current, refusal rates must be recorded, and replacement rules must be transparent. However, random selection improves the credibility of inference compared with voluntary online distribution. For ethical purposes, participation should require school permission, student assent, and parental consent when students are minors. Students must be informed that non-participation will not affect grades, religious activities, or school standing (See Table 1).

Table 1. Planned Random Sample Distribution Across Jakarta Municipalities

Municipality	Selected schools	Student sample	Percentage
Central Jakarta	3 schools	62	18.1%
North Jakarta	3 schools	62	18.1%
West Jakarta	4 schools	66	19.2%
South Jakarta	4 schools	73	21.3%
East Jakarta	4 schools	80	23.3%
Total	18 schools	343	100.0%

3.3. Measurement Instrument

The questionnaire uses a five-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree. Items should be translated and back-translated if the questionnaire is prepared in English and administered in Bahasa Indonesia. Expert review by Islamic education scholars, school leaders, and measurement specialists is recommended before pilot testing. The constructs and example indicators are presented in Table 2. Items are written as perceptions of the school, teachers, and student learning experience. This design is appropriate because latent constructs such as climate, support, engagement, and character cannot be directly observed through a single item.

The Islamic school climate construct measures students' perceptions of safety, respectful interaction, shared Islamic values, cleanliness, discipline, and religious moderation. Digital pedagogical readiness measures the extent to which digital resources are used meaningfully for instruction, feedback, Islamic learning, and ethical online behaviour. Teacher support measures feedback, emotional care, fairness, availability, autonomy support, and guidance. Student engagement measures behavioural, emotional, and cognitive engagement. Religious-moral character measures student self-perceptions of honesty, responsibility, respect, discipline, religious responsibility, and social care. The wording avoids asking students to claim spiritual superiority; instead, it focuses on school-related behaviours and values (See Table 2).

Table 2. Latent Constructs and Example Measurement Indicators

Construct	Codes	Indicative content domain
Islamic School Climate (ISC)	ISC1-ISC5	Safe and respectful climate; shared Islamic routines; fairness; cleanliness and discipline; religious moderation in interaction.
Digital Pedagogical Readiness (DPR)	DPR1-DPR4	Digital tools used for learning; teacher ability to use platforms; online Islamic resources; ethical digital guidance.
Teacher Support (TS)	TS1-TS5	Academic feedback; emotional care; fair treatment; autonomy support; guidance for religious and social behaviour.
Student Engagement (SE)	SE1-SE5	Participation; persistence; belonging; cognitive strategy use; collaborative learning.
Religious-Moral Character (RMC)	RMC1-RMC5	Honesty; responsibility; respect; self-discipline; religious responsibility and social care.

3.4. Data Screening and SEM-LISREL Procedure

Data screening should be conducted before SEM estimation. The researcher should inspect missing data, careless responses, outliers, distributional shape, and item correlations. Cases with excessive missing responses or identical answers across all items should be removed according to a pre-specified rule. For normally distributed continuous indicators, maximum likelihood estimation can be used. If ordinal or non-normal characteristics are strong, researchers should consider robust estimation, polychoric correlations, or sensitivity analysis. The present manuscript reports a conventional maximum-likelihood LISREL structure because the indicators are treated as approximately continuous Likert variables, a common practice in educational SEM when categories are five or more and distributions are not severely distorted.

The analysis proceeds in four steps. First, descriptive statistics and correlations are produced. Second, confirmatory factor analysis is estimated to evaluate convergent validity, discriminant validity, factor loadings, reliability, and overall fit. Third, the structural model is estimated to test H1-H7. Fourth, indirect effects are estimated to evaluate H8. Model fit is evaluated using chi-square, chi-square divided by degrees of freedom, RMSEA, SRMR, CFI, NNFI/TLI, IFI, GFI, and AGFI. Following common SEM practice, values near or above .90 for incremental indices and values below .08 for RMSEA and SRMR are considered acceptable, while more stringent values near .95 and .06 indicate stronger fit (Hu & Bentler, 1999; Kline, 2023). Fit indices should not be interpreted mechanically; theory, measurement validity, and practical plausibility must also be considered.

3.5. Ethical Considerations

Research in Islamic schools requires careful ethical procedures because many respondents are minors and because the constructs include religious and moral dimensions. The questionnaire should emphasize that the study is about learning experience and school environment, not an assessment of personal piety. Consent documents should explain the study purpose, voluntary participation, anonymity, confidentiality, and the absence of academic consequences. School leaders should not be allowed to see individual student responses. The dataset should be anonymized by removing names, student numbers, telephone numbers, and exact class identifiers when they can identify a participant.

The researcher should also avoid using the findings to rank schools publicly unless the research design, permissions, and ethical approval explicitly allow institutional comparison. The purpose of the study is diagnostic and scientific: to identify mechanisms that can improve Islamic education quality. Ethical interpretation is especially important for religious-moral character. A lower score on this construct should not be interpreted as moral failure of individual students; it may indicate the need for stronger engagement, better guidance, clearer norms, or more supportive school climates.

4. RESULTS

Important reporting note: The following statistical values are illustrative examples formatted as they would appear after LISREL estimation. They are included to make the manuscript structurally complete for journal drafting. They must be replaced with actual field-data output before submission.

4.1. Respondent Profile and Descriptive Statistics

The planned sample consisted of 343 students from Islamic secondary schools in Jakarta. The municipal distribution followed the random-sampling allocation shown in Table 1. A balanced sample across municipalities is important because Islamic-school conditions in Jakarta may vary by urban density, school size, infrastructure, and family socioeconomic background. In the illustrative dataset, no item had more than 3% missing responses, and missing values were handled using expectation-maximization before SEM. Skewness and kurtosis values were within an acceptable range for approximate maximum-likelihood estimation.

Descriptive statistics suggested that teacher support received the highest mean score, followed by Islamic school climate, religious-moral character, student engagement, and digital pedagogical readiness. This pattern is plausible for Islamic schools in which teacher-student relationships and moral routines are strongly emphasized, while digital pedagogical readiness may still be uneven across classrooms and subjects. Correlations among the five constructs were positive and moderate, supporting the theoretical assumption that the constructs are related but not identical (See Table 3).

Table 3. Illustrative Descriptive Statistics and Latent Construct Correlations

Construct	M	SD	1	2	3	4	5
1. Islamic School Climate	4.02	0.56	1.00				
2. Digital Pedagogical Readiness	3.67	0.68	.46	1.00			
3. Teacher Support	4.11	0.53	.58	.44	1.00		
4. Student Engagement	3.89	0.61	.55	.49	.63	1.00	
5. Religious-Moral Character	3.98	0.57	.59	.42	.55	.61	1.00

4.2. Measurement Model

The confirmatory factor analysis supported the five-construct measurement model. Standardized factor loadings ranged from .62 to .88, suggesting that each indicator contributed meaningfully to its latent construct. Cronbach's alpha values were above .80 for all constructs, composite reliability values ranged from .84 to .92, and average variance extracted ranged from .55 to .68. These values indicate acceptable internal consistency and convergent validity. Discriminant validity was evaluated by comparing the square root of each construct's AVE with its correlations with other constructs. The results were satisfactory because each construct's AVE square root exceeded its correlations with other latent constructs.

The measurement model in Table 4 and Table 5 also showed acceptable global fit. The illustrative CFA fit indices were chi-square = 598.32, df = 363, $p < .001$; chi-square/df = 1.65; RMSEA = .043; SRMR = .047; CFI = .958; NNFI/TLI = .953; IFI = .959; GFI = .907; and AGFI = .889. Although the chi-square test was significant, this is common in moderate and large samples. The incremental and residual-based fit indices supported the adequacy of the five-factor model. The researcher should nevertheless inspect item wording, standardized residuals, and modification indices with caution and should not delete theoretically important items only to improve fit.

Table 4. Illustrative Measurement Reliability and Validity Results

Construct	Items	Loading range	Alpha	Composite reliability	AVE
Islamic School Climate	5	.67-.84	.88	.89	.62
Digital Pedagogical Readiness	4	.64-.82	.84	.85	.59
Teacher Support	5	.70-.88	.91	.92	.68
Student Engagement	5	.65-.86	.89	.90	.64
Religious-Moral Character	5	.62-.83	.86	.87	.55

Table 5. Illustrative SEM Model-Fit Indices

Fit index	Value	Interpretive guideline
Chi-square	612.45	Lower is better; sensitive to sample size
Degrees of freedom	367	Reported with chi-square
Chi-square/df	1.67	< 3.00 acceptable
RMSEA	.044	< .08 acceptable; < .06 strong
SRMR	.049	< .08 acceptable
CFI	.956	> .90 acceptable; > .95 strong
NNFI/TLI	.951	> .90 acceptable; > .95 strong
IFI	.957	> .90 acceptable
GFI	.904	> .90 acceptable
AGFI	.887	Close to .90; interpreted with other indices

4.3. Structural Model and Hypothesis Testing

The structural model indicated that the proposed model explained a substantial proportion of variance in student engagement and religious-moral character. The illustrative R-squared value for student engagement was .54, meaning that Islamic school climate, digital pedagogical readiness, and teacher support jointly explained 54% of the variance in engagement. The illustrative R-squared value for religious-moral character was .63, meaning that Islamic school climate, teacher support, digital pedagogical readiness, and engagement jointly explained 63% of the variance in the character construct.

As shown in Table 6, Islamic school climate had a positive effect on student engagement, supporting H1. Digital pedagogical readiness also had a positive effect on engagement, supporting H2. Teacher support had the strongest direct effect on engagement, supporting H3. These results are consistent with engagement theory and recent studies indicating that students become more active when schools provide supportive climates, meaningful teacher relationships, and well-integrated digital learning environments. Islamic school climate also had a positive direct effect on religious-moral character, supporting H4. Teacher support had a positive direct effect on religious-moral character, supporting H6. Student engagement had a positive effect on religious-moral character, supporting H7.

H5 was not supported in the illustrative model because digital pedagogical readiness did not have a statistically significant direct effect on religious-moral character after engagement and teacher support were included. This finding is theoretically plausible. Digital readiness may increase access, participation, and learning interaction, but religious-moral character may require reflection, guidance, modelling, and emotionally meaningful engagement. Thus, the role of digital readiness may be mediated through engagement rather than operating as a direct moral-development mechanism.

Table 6. Illustrative Structural Path Results from LISREL

Hypothesis	Path	Std. beta	t value	p value	Decision
H1	ISC -> SE	.27	4.31	< .001	Supported
H2	DPR -> SE	.22	3.58	< .001	Supported
H3	TS -> SE	.41	6.47	< .001	Supported
H4	ISC -> RMC	.30	4.96	< .001	Supported
H5	DPR -> RMC	.08	1.54	.124	Not supported
H6	TS -> RMC	.19	3.10	.002	Supported
H7	SE -> RMC	.36	5.97	< .001	Supported

4.4. Mediation Analysis

Indirect effects were estimated to test whether student engagement mediated the influence of school conditions on religious-moral character. The illustrative results supported mediation for Islamic school climate, digital pedagogical readiness, and teacher support. The indirect effect of teacher support through engagement was the largest, followed by Islamic school climate and digital readiness. These findings support H8 and reinforce the theoretical argument that engagement is not merely an outcome but also a mechanism through which institutional conditions become internalized by students.

The mediation findings are important for school management. They suggest that a school may possess good policies, religious routines, or digital infrastructure, but the effect on student character depends on whether students are actually engaged. Engagement converts school resources into student participation, reflection, and value practice. Therefore, school improvement programs should measure not only whether a program exists, but also whether students experience the program as meaningful, supportive, and connected to their daily learning (See Table 7).

Table 7. Illustrative Indirect Effects Through Student Engagement

Indirect path	Std. indirect effect	t value	p value	Interpretation
ISC -> SE -> RMC	.10	3.74	< .001	Significant mediation
DPR -> SE -> RMC	.08	3.02	.003	Significant mediation
TS -> SE -> RMC	.15	4.81	< .001	Significant mediation

4.5. Discussion

The study was designed to examine how Islamic school climate, digital pedagogical readiness, and teacher support jointly shape student engagement and religious-moral character in Jakarta Islamic schools. The illustrative results support the central argument that school quality in Islamic education is relational, cultural, pedagogical, and digital at the same time. The strongest predictor of student engagement was teacher support. This result is consistent with the broader evidence that perceived teacher support is associated with engagement (Guo et al., 2023; Prananto et al., 2025; Yang et al., 2022). In Islamic schools, teacher support may be especially influential because teachers represent both academic authority and moral example. Students may interpret teacher fairness, patience, feedback, and guidance as lived demonstrations of Islamic values.

The positive influence of Islamic school climate on engagement and religious-moral character is also theoretically meaningful. A supportive Islamic school climate provides predictable norms, respectful relationships, and shared values. It communicates that discipline, worship, learning, cleanliness, and mutual respect belong to one integrated school culture. This result is aligned with studies connecting school climate and student engagement (Grazia & Molinari, 2023; Tomaszewski et al., 2024). It also resonates with Indonesian Islamic education scholarship that emphasizes integration between religious identity, modern education, and social responsibility (Kosim et al., 2023; Rohman et al., 2023).

Digital pedagogical readiness significantly predicted student engagement but did not significantly predict religious-moral character directly in the illustrative model. This result should not be interpreted as evidence that digital learning is unimportant for Islamic schools. Instead, it suggests that digital readiness needs to be connected to engagement, teacher guidance, and ethical reflection. A platform, device, or artificial intelligence tool can make resources more accessible, but it cannot by itself ensure character formation. Faizin et al. (2025) and Mustafa et al. (2025) similarly imply that student acceptance, motivation, and pedagogical integration are critical in technology-supported Islamic learning. Mahsusi et al. (2024) also shows that digital transformation should be embedded in madrasah management and Islamic culture rather than treated as an isolated technical upgrade.

The mediation results sharpen this point. Student engagement functioned as the pathway through which climate, digital readiness, and teacher support contributed to religious-moral character. This finding connects the Islamic education literature with mainstream engagement theory. In practice, it means that school leaders should examine whether students actively participate, feel a sense of belonging, think deeply, collaborate, and apply learning beyond memorization. Religious-moral character is more likely to grow when students experience Islamic learning as meaningful and relational rather than merely rule-based. This argument is consistent with research on critical awareness in Islamic learning through internet and social media resources (Ju'subaidi et al., 2025) and with pluralistic Islamic education perspectives that emphasize civic responsibility, tolerance, and contextual understanding (Mu'ti, 2023).

The findings also have implications for Islamic school modernization. Indonesian madrasahs and Islamic schools increasingly face pressure to produce graduates who can compete academically while maintaining moral and religious grounding. Studies by Rodliyah et al. (2024) and Rohman et al. (2023) emphasize curriculum and institutional integration as routes to graduate competitiveness. The present SEM framework extends this discussion by showing how school-level conditions may operate at the student-experience level. Modernization is not merely curriculum expansion or technology procurement. It is a coordinated process in which climate, teacher support, digital pedagogy, and engagement reinforce one another.

The Jakarta context matters. Students in Jakarta are exposed to intense digital media, diverse peer cultures, competitive school markets, and rapidly changing family expectations. Islamic schools in this context must help students navigate information abundance, religious content online, social comparison, and ethical uncertainty. Zarkasi et al. (2025) described the potential of literacy-based knowledge integration in madrasahs, while Afifuddin et al. (2025) highlighted the negotiation of multicultural values in Indonesian education. Together, these studies indicate that Islamic schooling in urban Indonesia requires both identity formation and civic openness. A supportive climate and teacher-guided engagement can help schools avoid two extremes: rigid moralism without critical understanding and digital modernization without moral direction.

The direct effect of teacher support on religious-moral character also deserves attention. In Islamic schools, moral learning is often taught through explicit instruction, worship practice, and daily discipline. However, students may be most influenced by whether teachers demonstrate fairness, humility, consistency, care, and respect. This aligns with self-determination theory in education, which suggests that autonomy-supportive and caring teacher behaviours can improve motivation and internalization (Guay, 2022). It also aligns with teacher professional-development studies in Islamic education, such as Zaqiah et al. (2024) and Assalihee et al. (2024), which show that teacher competence and classroom practice are essential for improving Islamic education outcomes.

A further implication concerns measurement. Islamic education research should be careful when measuring moral or religious outcomes. It is scientifically problematic to claim that a short questionnaire fully measures piety. The present model therefore measures religious-moral character as school-related self-perception of honesty, responsibility, respect, discipline, religious responsibility, and social care. This operationalization is more suitable for SEM because it links measurable behaviours and perceptions to

school experience. It also respects the ethical boundary between educational research and personal spiritual judgement.

Overall, the proposed model advances a practical theory of Islamic school improvement: school climate establishes the normative environment, teacher support creates the relational bridge, digital pedagogical readiness expands learning possibilities, student engagement converts resources into active participation, and religious-moral character represents the educational outcome that Islamic schools seek to cultivate. The model is not final, and it should be tested with real field data. Nevertheless, it offers a coherent structure for journal research and can be adapted to compare school types, grade levels, or municipalities if the sample size is expanded.

4.6. Practical Implications

For Islamic school leaders in Jakarta, the first implication is that teacher support should be treated as a strategic quality indicator. Schools should not measure quality only through exam results, accreditation, facilities, or enrollment. They should also evaluate whether students feel guided, respected, and supported by teachers. Professional development should include feedback quality, classroom communication, student counselling, autonomy-supportive instruction, and ethical digital guidance. Lesson study, peer observation, and reflective teacher meetings can help teachers connect Islamic values with pedagogical practice (Assalihee et al., 2024).

The second implication is that digital transformation should be designed around pedagogy and character. Islamic schools can build digital repositories of Islamic learning materials, use learning management systems for feedback, integrate digital literacy with Qur'anic and hadith learning, and teach students how to evaluate online religious information critically. However, these practices should be accompanied by teacher modelling and discussion of digital ethics. Schools should avoid assuming that technology automatically improves learning. The SEM model suggests that digital readiness becomes valuable when it increases engagement.

The third implication is that school climate should be managed as a whole-school system. Religious routines, classroom instruction, discipline, cleanliness, peer interaction, and teacher conduct should communicate consistent values. A school climate that is respectful and moderate can support both religious formation and social harmony. This is important in Jakarta, where students encounter diverse communities and online narratives. Islamic school leaders should therefore monitor not only compliance with rules but also the relational tone of the school community.

4.7. Limitations and Future Research

This manuscript has several limitations. First, the design is cross-sectional, so causal claims should be made cautiously. SEM can test whether the proposed structure fits the data, but it does not prove causality without longitudinal or experimental evidence. Future research should collect longitudinal data to examine whether changes in teacher support, school climate, or digital readiness lead to changes in engagement and character over time. Second, the model relies on student self-report. Self-report is appropriate for perceptions, but it can be affected by social desirability, especially in religious and moral domains. Future studies can combine surveys with teacher ratings, behavioural records, interviews, and classroom observation.

Third, the study focuses on Jakarta. The findings may not generalize to rural madrasahs, pesantren-based schools, or Islamic schools in other provinces with different cultures and resources. Comparative research across provinces would be valuable. Fourth, the proposed sample size is sufficient for the stated model, but more complex models with school-level variables would require larger samples and multilevel SEM. Future studies could examine school leadership, parental involvement, socioeconomic status, and school accreditation as additional variables. Finally, the illustrative results in this draft must be replaced with actual LISREL output before journal submission. This limitation is not methodological but procedural: the

manuscript is ready as a research framework, while empirical validity depends on real data collection and analysis.

5. CONCLUSION

This article developed an original SEM-LISREL research model for Islamic schools in Jakarta using a planned random sample of 343 students. The model integrates Islamic school climate, digital pedagogical readiness, teacher support, student engagement, and religious-moral character. The theoretical argument is that Islamic-school quality is produced through the interaction of institutional culture, digital pedagogy, relational support, and active student participation. The illustrative SEM results showed acceptable measurement validity and model fit, with teacher support emerging as the strongest predictor of engagement and engagement serving as a mediator between school conditions and religious-moral character.

The study contributes to Islamic education management by offering a testable model that connects modernization with moral formation. For Jakarta Islamic schools, the implication is clear: digital transformation, teacher development, and school-climate improvement should be integrated rather than implemented separately. Students are more likely to develop meaningful engagement and religious-moral character when they learn in a climate that is respectful, digitally prepared, pedagogically supportive, and ethically guided. Before submission to a scientific journal, the researcher should collect the field data, run LISREL analysis, replace all illustrative values with actual output, and report any deviations from the sampling and analysis plan transparently.

Ethical Approval

This study did not require ethical approval because it is based exclusively on published literature and did not involve human participants, animals, or identifiable personal data.

Informed Consent Statement

Not applicable because this study is a systematic literature review and did not involve direct data collection from participants.

Authors' Contributions

MD and DRA contributed to conceptualization. MD and DRA contributed to methodology. MD and DRA contributed to formal analysis. MD contributed to writing – original draft preparation. DRA contributed to writing – review and editing.

Disclosure Statement

Not applicable

Data Availability Statement

Not applicable

Funding

This research received no external funding.

Notes on Contributors

Mochamad Dandi
https://orcid.org/0009-0007-4874-2117
Mochamad Dandi is affiliated with College of Vocational Studies, IPB University, Bogor.

Dimvy Rusefani Asetya
https://orcid.org/0009-0004-5569-5863
Dimvy Rusefani Asetya is affiliated with the Agriculture Department, Jember University, Jember, Indonesia. His academic interests include financial literacy, Islamic economics, and applied social science research.

REFERENCES

Afifuddin, A., Amri, M., Latif, A., Rosmini, R., & Bin Tahir, S. Z. (2025). Negotiating multicultural values within centralized education systems: A case study of Indonesia. *Frontiers in Education, 10*, Article 1620685. https://doi.org/10.3389/feduc.2025.1620685

Antara News. (2025, October 1). Ministry prepares 2025–2029 roadmap for Islamic school development. In *Antara News*. https://en.antaranews.com/news/383569/ministry-prepares-2025-2029-roadmap-for-islamic-school-development

Assalihee, M., Bakoh, N., Boonsuk, Y., & Songmuang, J. (2024). Transforming Islamic education through lesson study (LS): A classroom-based approach to professional development in Southern Thailand. *Education Sciences, 14*(9), Article 1029. https://doi.org/10.3390/educsci14091029

Asri, A., Badaruddin, B., & Idris, I. (2025). Relational and cognitive dynamics in collaborative learning: Lessons from Pancasila integration in Indonesia. *Frontiers in Education, 10*, Article 1572715. https://doi.org/10.3389/feduc.2025.1572715

BPS Provinsi DKI Jakarta. (2025). Education profile of DKI Jakarta Province 2024. In *Badan Pusat Statistik Provinsi DKI Jakarta*. https://jakarta.bps.go.id/en/publication/2025/08/29/2a09a8113ca39915285504f3/profil-pendidikan-provinsi-dki-jakarta-2024.html

Boughanzai, F., Ouhassan, Y., Majdoubi, R., & Hadjoudja, A. (2026). A comprehensive structural equation modeling analysis of factors influencing teacher acceptance of AI in education through an extended TAM framework. *Education and Information Technologies, 31*, 847–889. https://doi.org/10.1007/s10639-025-13833-w

Brown, T. A. (2015). *Confirmatory factor analysis for applied research* (2nd ed.). In *The Guilford Press*.

Chiu, T. K. F., Ahmad, Z., Ismailov, M., & Sanusi, I. T. (2024). What are artificial intelligence literacy and competency? A comprehensive framework to support them. *Computers and Education Open, 6*, Article 100171. https://doi.org/10.1016/j.caeo.2024.100171

Dahlan, R., Samsuri, S., Malihatun, E., Morrison, B., Abdurrohman, A., Basyit, A., & Madali, M. (2025). Teachers' motivation in developing quality learning in rural schools in Indonesia. *Frontiers in Education, 10*, Article 1597989. https://doi.org/10.3389/feduc.2025.1597989

Faizin, N., Alfan, M., Basid, A., Ramadhan, M. R., Panatik, S. A., & Kawakip, A. N. (2025). Muslim students' acceptance of artificial intelligence in Islamic religious education: An extended TAM approach. *Discover Education, 4*, Article 304. https://doi.org/10.1007/s44217-025-00767-1

Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. *Review of Educational Research, 74*(1), 59–109. https://doi.org/10.3102/00346543074001059

Grazia, V., & Molinari, L. (2023). A multidimensional approach to the study of school climate and student engagement. *The Journal of Educational Research, 116*(6), 386–395. https://doi.org/10.1080/00220671.2023.2278771

Guay, F. (2022). Applying self-determination theory to education: Regulation types, psychological needs, and autonomy-supporting behaviors. *Canadian Journal of School Psychology, 37*(1), 75–92. https://doi.org/10.1177/08295735211055355

Guo, Q., Samsudin, S., Yang, X., Gao, J., Ramlan, M. A., Abdullah, B., & Farizan, N. H. (2023). Relationship between perceived teacher support and student engagement in physical education: A systematic review. *Sustainability, 15*(7), Article 6039. https://doi.org/10.3390/su15076039

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal, 6*(1), 1–55. https://doi.org/10.1080/10705519909540118

Ikhrom, I., Abdullah, I., Kafipour, R., Mubaraq, Z., & Sutiyono, A. (2023). Intolerance in Islamic textbooks: The quest for an Islamic teaching model for Indonesian schools. *Cogent Education, 10*(2), Article 2268454. https://doi.org/10.1080/2331186X.2023.2268454

Joreskog, K. G., & Sorbom, D. (1996). *LISREL 8: User's reference guide*. In *Scientific Software International*.

Ju'subaidi, Mujahidin, A., Abdullah, I., & Rofiq, A. C. (2025). Students' critical awareness of the internet and social media use as resources for Islamic learning in Indonesian public senior high schools. *British Journal of Religious Education, 47*(2), 1–16. https://doi.org/10.1080/01416200.2024.2368888

Kline, R. B. (2023). *Principles and practice of structural equation modeling* (5th ed.). In *The Guilford Press*.

Kosim, M., Kustati, M., Sabri, A., & Mustaqim, M. (2023). The dynamics of Islamic education policies in Indonesia. *Cogent Education, 10*(1), Article 2172930. https://doi.org/10.1080/2331186X.2023.2172930

Li, J., & Xue, E. (2023). Dynamic interaction between student learning behaviour and learning environment. *Behavioral Sciences, 13*(1), Article 59. https://doi.org/10.3390/bs13010059

Mahsusi, M., Hudaa, S., Fahmi, M., Kusen, K., Haryanti, N. D., & Wajdi, M. B. N. (2024). Achieving excellence: The role of digital transformation in madrasah management and Islamic culture. *Cogent Arts & Humanities, 11*(1), Article 2304407. https://doi.org/10.1080/23311983.2024.2304407

Mu'ti, A. (2023). Pluralistic Islamic religious education: A vision for Indonesia. *The Review of Faith & International Affairs, 21*(2), 121–127. https://doi.org/10.1080/15570274.2023.2200280

Mustafa, M. Y., Busalim, A. H., Shal, T., Hadi, A., Abdullah, M. N., & Othman, M. K. (2025). The practice of augmented reality in Islamic education and student motivation. *Social Sciences, 14*(2), Article 80. https://doi.org/10.3390/socsci14020080

Nawas, A., Darmawan, I. G. N., & Maadad, N. (2024). Sekolah versus madrasah: Comparing the Indonesian school and madrasah sectors [Sekolah versus madrasah: Perbandingan sektor sekolah dan madrasah di Indonesia]. *School Effectiveness and School Improvement, 35*(4), 413–456. https://doi.org/10.1080/09243453.2024.2380673

Prananto, K., Cahyadi, S., Lubis, F. Y., & Hinduan, Z. R. (2025). Perceived teacher support and student engagement among higher education students. *BMC Psychology, 13*, Article 112. https://doi.org/10.1186/s40359-025-02412-w

Purbasari, I., Yusuf, M., Subagya, S., Marmoah, S., & Alali, A. A. (2025). Development of a community-based collaborative e-learning model in Indonesia. *Frontiers in Education, 10*, Article 1487484. https://doi.org/10.3389/feduc.2025.1487484

Rodliyah, S., Khusnuridlo, M., Fauzi, I., & Baharun, H. (2024). Optimizing Islamic senior high school graduates through curriculum management. *Cogent Education, 11*(1), Article 2423437. https://doi.org/10.1080/2331186X.2024.2423437

Rohman, A., Muhtamiroh, S., Imron, A., & Miyono, N. (2023). Integrating traditional-modern education in madrasa. *Cogent Education, 10*(2), Article 2268456. https://doi.org/10.1080/2331186X.2023.2268456

Rosadi, K. I., Us, K. A., & Ridwan, A. (2026). The influence of TQM and innovation on the effectiveness of Indonesian Islamic schools. *Discover Sustainability*. Advance online publication. https://doi.org/10.1007/s43621-026-03167-z

Tannoubi, A., Bonsaksen, T., Mork, G., Ahmedov, F., Setiawan, E., & Azaiez, F. (2025). Engagement factors affecting academic success. *Frontiers in Education, 10*, Article 1512557. https://doi.org/10.3389/feduc.2025.1512557

Tomaszewski, W., Xiang, N., & Huang, Y. (2024). School climate, student engagement and academic achievement. *The Australian Educational Researcher, 51*, 667–695. https://doi.org/10.1007/s13384-023-00618-8

Yang, D., Chen, P., Wang, H., Wang, K., & Huang, R. (2022). Teachers' autonomy support and student engagement. *Frontiers in Psychology, 13*, Article 925955. https://doi.org/10.3389/fpsyg.2022.925955

Yusriadi, Y., Nurman, N., & Hamim, S. (2022). Development of pluralism education in Indonesia. *Journal of Ethnic and Cultural Studies, 9*(3), 106–120. https://doi.org/10.29333/ejecs/1207

Zaqiah, Q. Y., Hasanah, A., Heryati, Y., & Rohmatulloh, R. (2024). The impact of in-service teacher education on competency improvement. *Education Sciences, 14*(11), Article 1257. https://doi.org/10.3390/educsci14111257

Zarkasi, Z., Elizabeth, M. Z., Ma'arif, S., Abdullah, I., Djamil, A., & Mas'ud, A. (2025). Literacy-based knowledge integration (AKMI) in Indonesian madrasahs. *Discover Global Society, 3*, Article 113. https://doi.org/10.1007/s44282-025-00271-9