

Deep Learning, Islamic Character, and Student Well-Being: A Quality Improvement Model for Muhammadiyah Elementary Education in Probolinggo City

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Abstract:

The increasing complexity of contemporary education requires elementary schools to develop learning approaches that integrate academic achievement, character development, and students' holistic well-being. Islamic elementary education faces the challenge of strengthening educational quality while maintaining religious values, moral development, and positive learning experiences. This study aims to explore how deep learning pedagogy contributes to Islamic character formation and student well-being as an integrated quality-improvement model within Muhammadiyah elementary education. This study employed a qualitative approach with an exploratory interpretive orientation. The research was conducted in Muhammadiyah elementary education in Probolinggo City, East Java, Indonesia, over a three-month period from September to November 2025. Data were collected through semi-structured interviews and classroom observations involving nine participants, consisting of five teachers and four students. The data were analysed using reflexive thematic analysis to identify patterns of pedagogical practices, Islamic character development, and students' learning experiences. The findings reveal an integrated model consisting of three interconnected dimensions: deep learning pedagogy, Islamic character formation, and student well-being. Deep learning practices were manifested through meaningful, mindful, and joyful learning experiences that encouraged reflection, active participation, and contextual understanding. Islamic character formation occurred through value integration, internalisation, habituation, and moral action embedded within classroom and school practices. Furthermore, student well-being was strengthened through positive emotions, engagement, supportive relationships, safety, and a sense of belonging. This study contributes to the development of Islamic educational quality models by demonstrating that sustainable improvement in Muhammadiyah elementary education emerges from the synergy between pedagogical innovation, moral-spiritual development, and students' holistic well-being.

Abstrak:

Kompleksitas pendidikan kontemporer menuntut sekolah dasar untuk mengembangkan pendekatan pembelajaran yang mampu mengintegrasikan pencapaian akademik, pembentukan karakter, dan kesejahteraan holistik peserta didik. Pendidikan dasar Islam menghadapi tantangan untuk memperkuat mutu pendidikan sekaligus mempertahankan nilai-nilai keagamaan, perkembangan moral, dan pengalaman belajar yang positif. Penelitian ini bertujuan untuk menganalisis bagaimana pedagogi deep learning berkontribusi terhadap pembentukan karakter Islam dan kesejahteraan peserta didik

ARTICLE HISTORY

Received: Juli 2025

Revised : Juli 2025

Accepted: Juli 2025

KEYWORDS

deep learning
pedagogy; Islamic
character education;
student well-being;
Muhammadiyah
elementary education;
educational quality
improvement

KATA KUNCI:

pedagogi deep learning;
pendidikan karakter
Islam; kesejahteraan
peserta didik;
pendidikan dasar
Muhammadiyah;
peningkatan mutu
pendidikan

sebagai suatu model peningkatan mutu pendidikan yang terintegrasi pada pendidikan dasar Muhammadiyah. Penelitian ini menggunakan pendekatan kualitatif dengan orientasi interpretatif eksploratif. Penelitian dilaksanakan pada lembaga pendidikan dasar Muhammadiyah di Kota Probolinggo, Jawa Timur, Indonesia, selama periode tiga bulan, yaitu September hingga November 2025. Data penelitian dikumpulkan melalui wawancara semi-terstruktur dan observasi pembelajaran yang melibatkan sembilan partisipan, terdiri atas lima guru dan empat peserta didik. Data dianalisis menggunakan analisis tematik reflektif untuk mengidentifikasi pola praktik pedagogis, pengembangan karakter Islam, dan pengalaman belajar peserta didik. Hasil penelitian menunjukkan bahwa model peningkatan mutu pendidikan dibangun melalui tiga dimensi yang saling berkaitan, yaitu pedagogi deep learning, pembentukan karakter Islam, dan kesejahteraan peserta didik. Praktik deep learning diwujudkan melalui pembelajaran bermakna, reflektif, dan menyenangkan yang mendorong keterlibatan aktif, pemaknaan pengalaman, serta pemahaman kontekstual peserta didik. Pembentukan karakter Islam berlangsung melalui proses integrasi nilai, internalisasi, pembiasaan, dan tindakan moral yang tertanam dalam praktik pembelajaran dan budaya sekolah. Selain itu, kesejahteraan peserta didik diperkuat melalui pengalaman emosi positif, keterlibatan belajar, hubungan sosial yang mendukung, rasa aman, dan rasa memiliki terhadap lingkungan sekolah. Penelitian ini berkontribusi terhadap pengembangan model mutu pendidikan Islam dengan menunjukkan bahwa peningkatan mutu pendidikan dasar Muhammadiyah yang berkelanjutan terbentuk melalui sinergi antara inovasi pedagogis, pengembangan moral-spiritual, dan kesejahteraan holistik peserta didik.

INTRODUCTION

Contemporary primary education faces a global imperative to move beyond the transmission of disciplinary knowledge toward pedagogies that simultaneously cultivate deep understanding, character, agency, and student well-being (Darling-Hammond et al., 2020). Research on the science of learning and development demonstrates that meaningful learning emerges when cognitive, social, emotional, and contextual dimensions are treated as interconnected rather than as separate educational outcomes (Darling-Hammond et al., 2020). This holistic orientation is particularly relevant to deep learning pedagogy, understood here not as artificial-intelligence-based deep learning but as an educational approach that promotes meaningful engagement, reflective awareness, knowledge transfer, learner agency, and active participation in authentic contexts (Bryce & Blown, 2024).

Evidence from school-based social and emotional learning further demonstrates that pedagogical experiences addressing students holistically can improve social-emotional competencies, attitudes, behavior, peer relationships, school functioning, and academic achievement across diverse educational systems (Cipriano et al., 2023). Similar cross-cultural evidence from China indicates that educational interventions integrating cognitive and social-emotional development can enhance positive social behavior while reducing emotional distress (Chen & Yu, 2022). For Islamic education, this holistic agenda has additional significance because meaningful learning is expected to connect intellectual development with moral consciousness, spiritual meaning, responsible action, and human

flourishing (Zuhdi & Syarief, 2023).

Thus, integrating deep learning pedagogy with Islamic character formation and student well-being offers a potentially important pathway for reconciling academic depth, moral development, and positive educational experience in contemporary Islamic primary schooling (Darling-Hammond et al., 2020; Cipriano et al., 2023). Previous studies across educational contexts provide important but fragmented evidence concerning these three domains. A contemporary meta-analysis involving 424 studies, 53 countries, and 575,361 students found that universal school-based social-emotional learning significantly improved students' competencies, attitudes, behavior, school climate, peer relationships, and academic outcomes, demonstrating that well-being-supportive pedagogy can coexist with academic development (Cipriano et al., 2023).

Evidence from China similarly shows that culturally situated social-emotional interventions improve students' social-emotional competence and reduce emotional distress, suggesting that pedagogical effectiveness is inseparable from cultural context (Chen & Yu, 2022). In Japan, school-based social-emotional interventions have also been examined as mechanisms for strengthening children's social-emotional competencies while addressing emotional and behavioral difficulties (Takizawa et al., 2023). Within Islamic educational settings, well-being has increasingly been conceptualized as a multidimensional construct involving relationships, meaningful learning, spirituality, personal development, and positive educational environments rather than merely the absence of psychological problems (Zuhdi & Syarief, 2023).

More specifically within Muhammadiyah elementary education, recent empirical research reports that deep learning practices can support conceptual understanding, critical reflection, student-centered learning, and teacher pedagogical transformation, while studies of character education show that Islamic and Muhammadiyah values are commonly embedded through curriculum, school culture, habituation, and classroom practices. Nevertheless, these emerging Muhammadiyah studies remain geographically concentrated in Indonesia and predominantly examine deep learning, character formation, or educational well-being as separate phenomena rather than as an integrated pedagogical configuration.

This fragmentation reveals a significant research gap. International research provides substantial evidence for holistic, student-centered, socially and emotionally responsive pedagogies, but rarely examines how such pedagogies interact with explicitly Islamic moral and spiritual values in primary education (Cipriano et al., 2023; Zuhdi & Syarief, 2023). Conversely, studies in Islamic education have begun to conceptualize well-being in relation to spirituality and educational meaning, yet empirical investigations connecting these dimensions to classroom-level deep learning pedagogy remain limited (Zuhdi & Syarief, 2023). The gap becomes more pronounced in Muhammadiyah elementary schools, where character formation is institutionally embedded in Islamic educational identity but the pedagogical mechanisms connecting meaningful, mindful, and joyful learning with Islamic character and student well-being remain insufficiently theorized and empirically documented.

Existing evidence also suggests that the effects of holistic educational interventions vary according to cultural setting, implementation quality, intervention characteristics, and school context, making context-sensitive investigation necessary rather than assuming

universal pedagogical effects (Chen & Yu, 2022; Cipriano et al., 2023). Furthermore, the emerging literature on Indonesian deep learning pedagogy has tended to emphasize conceptual understanding, teacher readiness, critical thinking, or instructional transformation, leaving the relationship among deep learning practices, Islamic value internalization, and multidimensional student well-being underexplored.

Consequently, there is a need for an empirically grounded framework explaining how deep learning pedagogy operates within the distinctive religious, pedagogical, and organizational ecology of Muhammadiyah elementary education. Addressing this gap, the present study proposes an operational integration of deep learning pedagogy, Islamic character formation, and student well-being as mutually reinforcing dimensions of primary education rather than independent educational outcomes. Deep learning pedagogy is operationalized through meaningful learning that connects knowledge with students' lived experiences, mindful learning that encourages awareness and critical reflection, and joyful learning that promotes engagement, positive emotion, and psychologically supportive classroom participation; these principles are consistent with evidence emphasizing the interdependence of cognition, emotion, relationships, and context in effective learning (Darling-Hammond et al., 2020).

Islamic character is operationalized through observable processes of value understanding, reflection, internalization, and enactment in students' personal and social behavior, thereby moving beyond character education understood merely as religious habituation. Student well-being is simultaneously examined through students' positive learning experiences, sense of belonging, supportive relationships, engagement, emotional safety, and meaningful participation, dimensions supported by contemporary evidence on school-based social-emotional development (Cipriano et al., 2023; Takizawa et al., 2023).

The novelty therefore lies not in examining deep learning, Islamic character, or well-being independently, but in identifying the pedagogical mechanisms through which meaningful, mindful, and joyful learning can simultaneously facilitate Islamic character formation and student well-being within the culturally distinctive context of Muhammadiyah primary education. Such integration extends existing holistic-learning scholarship by introducing religious character as an analytically explicit dimension of deep and well-being-oriented pedagogy. Accordingly, this study aims to investigate how deep learning pedagogy is implemented to foster Islamic character and student well-being in Muhammadiyah elementary schools, responding to the growing need for culturally grounded approaches that integrate academic, moral, social, and emotional dimensions of learning (Darling-Hammond et al., 2020; Cipriano et al., 2023).

Rather than treating pedagogical practice, Islamic character, and student well-being as isolated variables, the study examines their interactions within authentic classroom and school practices, consistent with evidence that learning and development are shaped through dynamic relationships among individual, instructional, relational, and contextual factors (Darling-Hammond et al., 2020). Specifically, the study addresses the following research question: How is deep learning pedagogy implemented to foster Islamic character and student well-being in Muhammadiyah elementary schools? This question directs attention to pedagogical strategies, meaningful and reflective learning experiences, Islamic value internalization, teacher-student interactions, and conditions supporting students' positive educational experiences. By answering this question, the study seeks to generate a

context-sensitive pedagogical explanation that can contribute to international scholarship on deep learning while extending the discussion of holistic education into Islamic primary-school settings.

METHODS

This study employed a qualitative research approach to develop an empirically grounded understanding of how deep learning pedagogy, Islamic character formation, and student well-being interact as components of a quality-improvement model in Muhammadiyah elementary education. A qualitative approach was considered appropriate because the study sought to interpret participants' experiences, meanings, classroom practices, and contextual processes rather than quantify relationships among predetermined variables, consistent with contemporary approaches emphasising interpretive and reflexive engagement with qualitative data (Braun & Clarke, 2021). The study adopted an exploratory interpretive orientation in which pedagogical practices and participants' perspectives were examined within their natural school contexts, allowing patterns of meaning to be generated across multiple sources of evidence (Byrne, 2022). The research was conducted over a three-month period from September to November 2025, encompassing research preparation, ethical procedures, participant recruitment, data collection, data analysis, and manuscript preparation.

The study was conducted in Muhammadiyah elementary schools in Probolinggo City, East Java, Indonesia, selected as a bounded educational context representing Islamic primary education within the Muhammadiyah school system. The research site was selected purposively because it represents an educational environment that integrates Islamic character development, innovative pedagogical practices, and efforts to improve educational quality. Participants comprised 5 teachers and 4 students, resulting in 9 participants in total, and were recruited through purposive sampling according to their direct involvement in classroom learning and school-based Islamic character development. Participant adequacy was evaluated in relation to the informational contribution of participants to the research objectives rather than statistical representativeness, because qualitative sampling prioritises the relevance, specificity, and richness of information needed to explain the phenomenon under investigation.

The object of inquiry encompassed three interconnected domains: the enactment of deep learning pedagogy, the processes through which Islamic character was cultivated and internalised, and the learning experiences and school conditions associated with student well-being. Data were generated during September–October 2025 through semi-structured interviews and direct classroom observations to obtain complementary accounts of participants' perspectives and naturally occurring pedagogical practices. Semi-structured interviews were selected because an interview protocol can provide systematic coverage of predetermined topics while retaining sufficient flexibility to explore participants' experiences and emerging issues in depth (Abraham & Padmakumari, 2026). The interview guide was organised around three domains derived from the study objectives: teachers' implementation of meaningful, mindful, and joyful learning; practices supporting the understanding, internalisation, and enactment of Islamic values; and participants' perceptions of student engagement, positive emotions, relationships, belonging, and well-being.

The interview guide was reviewed for conceptual alignment and piloted before the

main interviews, because contemporary methodological guidance recommends establishing conceptual foundations, systematically structuring questions and probes, and iteratively refining qualitative interview protocols (Abraham & Padmakumari, 2026). Classroom observations focused on teacher–student interactions, learning activities, reflective practices, Islamic value enactment, student participation, emotional expressions, and classroom conditions relevant to well-being, while field notes documented contextual and reflective information surrounding observed events (Sundberg et al., 2021).

Data collection proceeded sequentially through school access and participant recruitment, informed-consent procedures, classroom observations, semi-structured interviews, verbatim transcription, and organisation of observational field notes. Interviews were audio-recorded with participants' permission and transcribed verbatim, while identifying information was removed during data preparation to protect confidentiality. For student participants, participation was voluntary and required appropriate parental or guardian consent and student assent in accordance with institutional ethical requirements. Data collection and preliminary analysis proceeded iteratively throughout the research period so that emerging interpretations could inform subsequent observations and interview probes, thereby strengthening the contextual depth of the dataset.

The dataset was analysed using reflexive thematic analysis, which is appropriate for identifying and interpreting patterned meanings across qualitative datasets while acknowledging the researcher's active interpretive role in knowledge production (Braun & Clarke, 2021). Data analysis was conducted during October–November 2025 and followed six recursive phases: familiarisation with interview transcripts and observational notes, systematic coding, generation of initial themes, review and development of themes, definition and naming of themes, and production of the analytical narrative, consistent with contemporary applications of Braun and Clarke's reflexive thematic analysis (Byrne, 2022).

Interview transcripts and observational field notes were coded using NVivo software to facilitate systematic data organisation, retrieval, comparison, and documentation of the coding process. No statistical significance test was applied because the study was qualitative and interpretive rather than inferential. Themes were developed around relationships among deep learning practices, Islamic character formation, student well-being, and school-quality improvement rather than merely counting code frequencies, consistent with reflexive thematic analysis as an interpretive pattern-based analytical approach (Braun & Clarke, 2021; Byrne, 2022). The final interpretation and refinement of findings were completed during November 2025.

FINDINGS AND DISCUSSION

The findings revealed an integrated quality-improvement model comprising four interconnected themes: deep learning pedagogy, Islamic character formation, student well-being, and quality improvement in Muhammadiyah elementary education. As illustrated in Figure 1, deep learning pedagogy constitutes the instructional foundation of the model and is manifested through meaningful, mindful, and joyful learning. The interview data indicated that meaningful learning was facilitated by connecting subject matter with students' everyday experiences, whereas mindful learning involved questioning, reasoning, reflection, and evaluation of understanding. Joyful learning was characterized by educational games, group discussions, projects, and interactive activities that encouraged

students' active participation. Teachers consequently positioned learning beyond memorization by emphasizing understanding, reflection, and the application of knowledge in authentic contexts.

The second theme demonstrates that deep learning was closely connected with Islamic character formation through value integration, internalization, habituation, and moral action. Islamic values were incorporated not only into religious subjects but also into classroom activities and everyday school practices. Teachers reinforced these values through explanation and modelling, while students practiced prayer, discipline, honesty, cleanliness, responsibility, and social care. The interview findings further indicated that character formation became observable through students' willingness to assist peers, fulfill responsibilities, demonstrate discipline, and avoid harmful interpersonal behavior.

The third theme, student well-being, emerged through positive emotion, learning engagement, positive relationships, and safety and belonging. Students reported enjoying interactive learning activities, becoming more confident in expressing ideas, receiving support from teachers and peers, and feeling comfortable when mistakes were treated as opportunities for further learning. These findings indicate that pedagogical engagement and Islamic character practices were accompanied by a supportive social-emotional learning environment.

Figure 1 synthesizes these findings into a sequential yet interconnected model: Deep Learning Pedagogy Islamic Character Formation Student Well-Being Quality Improvement. Quality improvement was reflected in improved learning quality, stronger Islamic character, higher student well-being, and holistic school development. The model also identifies school leadership, Islamic school culture, teacher professional development, and family-community involvement as contextual and institutional supports. Continuous reflection and improvement operate as a feedback mechanism connecting educational outcomes with subsequent pedagogical development. Thus, the findings suggest that quality improvement in Muhammadiyah elementary education in Probolinggo City is constructed through the integration of cognitively meaningful learning, Islamic moral development, and students' positive educational experiences.

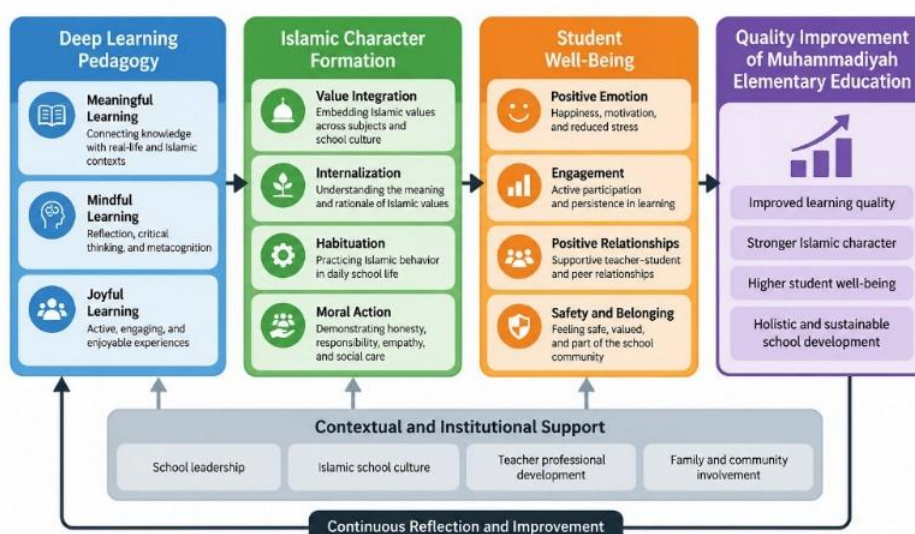


Figure 1. A Model of Deep Learning, Islamic Character, and Student Well-Being for Quality Improvement in Muhammadiyah Elementary Education

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DISCUSSION

The model presented in Figure 1 suggests that quality improvement in Muhammadiyah elementary education should not be conceptualized merely as an increase in academic attainment, but as an integrated developmental process in which cognitively demanding learning, moral formation, and students' socio-emotional experiences mutually reinforce one another (Darling-Hammond et al., 2020; Cipriano et al., 2023). The positioning of meaningful, mindful, and joyful learning as the pedagogical foundation is theoretically important because learning connected to authentic life situations can promote both cognitive understanding and motivation when students perceive tasks as personally relevant rather than as decontextualized academic exercises (Nachtigall et al., 2022).

This interpretation supports the finding that meaningful learning in Muhammadiyah schools should involve connections between subject matter, students' everyday experiences, and Islamic contexts, rather than treating "deep learning" simply as more intensive content delivery (Nachtigall et al., 2022; Darling-Hammond et al., 2020). At the same time, previous evidence cautions against assuming that authentic or contextualized tasks automatically generate deeper learning, because their effectiveness varies according to instructional design, perceived authenticity, learner agency, and the interaction among learning activities (Nachtigall et al., 2022). Thus, Figure 1 is best interpreted as a relational model rather than a deterministic linear sequence in which one pedagogical activity necessarily produces the subsequent outcome (Nachtigall et al., 2022; Cipriano et al., 2023).

The second contribution of the model is its positioning of Islamic character formation between pedagogical experience and educational quality, indicating that values must progress from integration into instruction toward internalization, habituation, and observable moral action (Brunsdon & Walker, 2022; Chang, 2022). This finding is consistent with character-education scholarship arguing that moral development requires more than the transmission of rules because students need opportunities to exercise virtues, make judgments, experience relationships, and enact responsibility in authentic social circumstances (Brunsdon & Walker, 2022).

Evidence from elementary-school students also shows that moral-character development is associated with happiness, parent-child relationships, teacher-student relationships, and participation in prosocial activities, reinforcing the present study's integration of character with relational and affective dimensions of schooling (Chang, 2022). Consequently, Islamic character in Muhammadiyah education can be interpreted not merely as ritual habituation but as a developmental process in which religious values become translated into honesty, responsibility, empathy, discipline, and social care through repeated pedagogical and interpersonal experiences (Brunsdon & Walker, 2022; Chang, 2022).

The model further advances the argument that student well-being is not an additional outcome separated from learning quality but a condition through which engagement and development can be sustained (Cipriano et al., 2023; Liu et al., 2021).

Cross-cultural evidence demonstrates that need-supportive teaching is positively related to subjective, social, and eudaimonic well-being, supporting the present emphasis on positive emotion, engagement, supportive relationships, safety, and belonging (Liu et al., 2021). Similarly, longitudinal evidence indicates that supportive class and school climates can protect students' school well-being, whereas unfavorable educational conditions may contribute to declining school satisfaction and stronger negative attitudes toward schooling (Rautanen et al., 2021). The importance assigned in Figure 1 to teacher-student relationships is also supported by evidence that relational closeness contributes positively to engagement, while conflict undermines students' behavioral and emotional participation in schooling (Quin, 2022). These findings therefore challenge quality-improvement approaches that rely predominantly on test scores, because a school may increase measurable achievement without necessarily creating the relational and emotional conditions required for sustainable learning and flourishing (Cipriano et al., 2023).

A particularly important theoretical implication concerns the contextual and institutional support layer depicted in Figure 1, because it shifts explanation from individual teacher behavior toward a school-level ecology involving leadership, culture, professional development, and family-community participation (Darling-Hammond et al., 2020; Berger et al., 2022). This systemic interpretation accords with evidence that educator and student well-being are shaped by both individual and organizational conditions, making interventions directed solely at individual behavior insufficient when school structures and cultures remain unchanged (Berger et al., 2022).

The inclusion of teacher professional development is similarly justified because meta-analytic evidence shows that professional development can strengthen teacher knowledge and skills and can produce smaller but meaningful improvements in student behavior, although effects depend considerably on implementation quality (Donath et al., 2023). Practically, Muhammadiyah schools in Probolinggo should therefore align curriculum design, classroom pedagogy, teacher development, Islamic school culture, student-support systems, and family engagement rather than implementing deep learning as an isolated classroom technique (Darling-Hammond et al., 2020; Donath et al., 2023). Finally, the feedback loop of continuous reflection and improvement strengthens the model by conceptualizing educational quality as an iterative process in which pedagogical practices and institutional arrangements are continuously evaluated against students' learning, character, and well-being outcomes rather than treated as fixed programs (Cipriano et al., 2023; Nachtigall et al., 2022).

CONCLUSION

This study concludes that quality improvement in Muhammadiyah elementary education in Probolinggo City can be understood through an integrated framework connecting deep learning pedagogy, Islamic character formation, and student well-being. Rather than positioning academic learning, character education, and well-being as separate educational domains, the proposed model conceptualizes them as mutually reinforcing dimensions of holistic school quality. The principal novelty lies in integrating meaningful, mindful, and joyful learning with the processes of Islamic value integration, internalization, habituation, and moral action, while simultaneously positioning positive emotion, engagement, supportive relationships, safety, and belonging as essential conditions for sustainable educational improvement. This framework extends holistic learning perspectives by incorporating Islamic character as an explicit mediating developmental dimension and by recognizing contextual and institutional support as an enabling mechanism. Practically, the findings suggest that Muhammadiyah elementary schools should align classroom pedagogy with Islamic school culture, supportive teacher–student relationships, teacher professional development, school leadership, and family-community involvement rather than implementing deep learning as an isolated instructional strategy. The study is limited by its qualitative design and context-specific setting in Muhammadiyah elementary education in Probolinggo City, which restrict statistical generalization to other educational contexts. Future research should therefore validate the proposed model across diverse Muhammadiyah and other Islamic primary schools using mixed-method, longitudinal, or design-based approaches. Further studies should also examine the mechanisms and reciprocal relationships among deep learning, Islamic character, student well-being, and school quality to establish the model's transferability, explanatory power, and practical effectiveness.

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