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A DEEP LEARNING-BASED PERSONAL FEEDBACK SYSTEM TO STRENGTHEN THE LOVE CURRICULUM IN CULTIVATING MODERATE ISLAMIC VALUES IN HIGH SCHOOLS

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Abstract

This study examines the integration of a deep learning-based personal feedback system as an innovative strategy to strengthen the Love Curriculum in cultivating moderate Islamic values among high school students. Employing a qualitative case study at Madrasah Aliyah Muhammadiyah Bandar, data were collected through interviews, classroom observations, and document analysis to investigate the system's design and its effectiveness. Interview data revealed experiences of teachers and students, classroom observations captured authentic learning interactions, and documents provided objective support. All data were analyzed through qualitative reduction, display, and conclusion drawing, strengthened by triangulation to ensure understanding of design implementation. The findings indicate that the system utilizes artificial neural networks to analyze students' cognitive, affective, and behavioral data, enabling adaptive and personalized feedback tailored to individual characteristics. This feedback not only supports academic performance but also reinforces emotional awareness, empathy, tolerance, and appreciation of diversity through narrative-based guidance and value-oriented recommendations. Furthermore, the system effectively bridges religious concepts with real-life contexts, enhancing students' internalization and practical application of moderate Islamic values. The implementation also improves teacher–student interaction and promotes parental involvement, although challenges persist regarding digital literacy and access to technological devices. Overall, the study concludes that deep learning-based feedback systems hold significant potential in transforming religious education into a more contextual, adaptive, and value-based learning model in the digital era. This research is important because it shows how artificial intelligence strengthens values-based learning through digital feedback and provides a conceptual-practical basis for policymakers to modernize religious education without losing its essence.

Keywords

Deep Learning, Feedback System, Love Curriculum, Moderate Islamic Values, Religious Education.

INTRODUCTION

Islamic religious education in the digital era faces new complexities with the increasing flow of information, social media penetration, and intensified social polarization that strengthens the spread of intolerance and extremism among students (Syahrin, 2025; Prihatin, et al., 2025). This condition demands pedagogical innovation that not only emphasizes ritual aspects, but also the internalization of universal values such as compassion, tolerance, and respect for diversity, as emphasized in the Love Curriculum (Afida et al., 2025) and the moderate Islamic education framework (Alsi, 2025; Ni'mah, 2025; Wahid, 2024). In the context of Madrasah Aliyah Muhammadiyah Bandar, the main academic problem of this research lies in the weakness of the feedback personalization mechanism and the lack of evaluation tools that are able to assess the internalization of moderation values in a sustainable manner, as also highlighted in the study of religious digital literacy (A. S. Hidayatullah et al., 2025; Rahmat & Utomo, 2025). Therefore, this study develops a Deep Learning-Based Personalized Feedback System (SUP-PM) that utilizes deep learning models to analyze students' cognitive-affective response patterns and generate adaptive feedback tailored to their value development needs. This approach aligns with the findings of Wisniewski et al. (2020), who emphasized that personalized feedback is one of the most powerful factors in improving learning, including character building. Furthermore, the contributions of figures such as Geoffrey Hinton, Yoshua Bengio, and Yann LeCun in the development of deep neural networks have strengthened educational analytics and opened up opportunities for more effective AI applications in the context of moderate religious values education (Lecun et al., 2015; Setiyo et al., 2025).

The Data on the effectiveness of SUP-PM was obtained through a quasi-experimental trial study at Madrasah Aliyah Muhammadiyah Bandar involving 70 students, with measurements using the religious moderation index instrument based on indicators from the Indonesian Ministry of Religious Affairs through pretests and posttests. The results showed an increase in the average score from 55.8 to 71.2 after the implementation of SUP-PM, with the most prominent increase in the indicators of intergroup empathy and respect for differences, which aligns with the focus of the Love Curriculum and is supported by per-indicator analysis and learning observations.

The academic concern of this research stems from the gap between the ideal goals of Islamic education, which emphasize the formation of wasathiyah attitudes, and the reality of the internalization of moderate Islamic values among 70 students of Madrasah Aliyah Muhammadiyah

Bandar, who still show a tendency towards textual religious understanding and are less trained in responding to differences empathetically. In fact, madrasas have a strategic position in shaping the orientation of students' religious attitudes at a crucial stage of development. Therefore, the internalization of religious moderation must be carried out systematically and pedagogically so that it does not stop at the cognitive level, but is manifested in attitudes and behavior. This urgency has a strong legal basis, namely Law Number 20 of 2003 concerning the National Education System and the policy of the Indonesian Ministry of Religious Affairs on Religious Moderation, which emphasizes the role of madrasas in instilling the values of tolerance, balance, empathy, and respect for diversity. Therefore, this research is relevant academically, pedagogically, and legally.

This finding is consistent with Badri, (2022), which asserts that reflective, experience-centered value learning is more effective in increasing tolerance, in line with Cranton's transformational learning theory. The SUP-PM system has also been shown to increase student participation in class discussions and reduce intolerant expressions in reflection tasks, suggesting that the use of artificial intelligence-based technology can strengthen affective involvement in religious learning (Ningtyas & Sihombing, 2023). The integration of Neuro-Linguistic Programming (NLP) as part of a feedback strategy also strengthens the impact of behavioral change through the transformation of students' mindsets and communication patterns (Witkowski, 2010). Furthermore, the use of a mobile collaborative learning approach, as explained by S. Mollah, (2024), supports increased student engagement post-pandemic through structured reflective and dialogical activities, as also emphasized by Koole in his study on mobile learning-based educational transformation.

Based on these findings, this study formulates an integration model between deep learning technology and the Love Curriculum, which is modular and sustainable, in line with studies on the integration of deep learning in Islamic education (Santoso, 2025). This model consists of four main components: (1) a data layer to collect learning artifacts and moderation value indicators, as mapped in a bibliometric analysis of deep learning adoption in the digital transformation of Islamic education (Hasanah et al., 2025), (2) modeling layer based on deep neural networks to predict the level of internalization of values and provide personalized feedback, which is in line with the PAI learning model based on deep learning (Aliyah, et al., 2025), (3) pedagogical interface in the form of a teacher-student dashboard as a vehicle for adaptive interaction as recommended in the integration of curriculum and deep learning technology (Syuhada et al., 2025), and (4) governance layer that ensures ethical data use and strengthening of PAI teacher competencies, in line with studies on the

integration of AI, curriculum, and global value governance (Yuniar et al., 2023). The implementation results show that the learning model is able to classify moderation tendencies with an accuracy of 0.86 and increase student retention by up to 78%, supporting the finding that the deep learning curriculum is relevant for strengthening moderation values in Islamic Religious Education (Kurnia et al., 2025). This simultaneously confirms the readiness of SUP-PM as a long-term pedagogical tool. Furthermore, this integration model aligns with the ideas of moderate Islamic education pioneered by Abdurrahman Wahid and Nurcholish Madjid, which emphasize inclusivity, rationality, and respect for human dignity (Asiyah, 2021). Thus, SUP-PM has the potential to become a strategic innovation in strengthening students' religious moderation while providing theoretical and practical contributions to the development of technology-based Islamic education in Indonesia, as also emphasized in the study of multicultural Islamic education (W. Hidayatullah et al., 2022; Irhamuddin et al., 2024).

In the past five years, various studies related to the variables of Feedback Systems, Deep Learning, the Love Curriculum, Moderate Islamic Values, and other pedagogical variables have pointed to the direction of strengthening technology-based Islamic education. Research by Choiriyah et al. (2025) found that digital feedback systems increase the effectiveness of learning evaluations, although the aspect of personalized values has not been addressed; research by Yani & Kusrini (2025) found that deep learning can strengthen learning analytics but is still limited to improving academic achievement without addressing the internalization of religious values; research by Mujahidin et al. (2025) found that the Love Curriculum effectively fosters empathy and compassion among students, but is not yet supported by adaptive technology to continuously monitor value development; research by Inayati & Saputri (2025) found that moderate Islamic education requires a reflective-dialogical approach, but has not utilized an artificial intelligence-based analytical model to map students' moderation tendencies; and research by Sayeed et al. (2018) found that mobile-based collaborative learning increases student participation, but has not yet been integrated with an intelligent feedback system to support values-based learning. Despite making important contributions, these five studies leave four main gaps: (1) the absence of a model that integrates a deep learning-based personal feedback system with the aim of internalizing moderate Islamic values; (2) the focus of previous research has been more on cognitive achievement than on character formation based on analysis of affective response patterns; (3) the Love Curriculum has not been developed within an AI-based framework that allows for adaptive and continuous value

monitoring; and (4) analysis of religious moderation is still carried out manually without the support of neural network modeling that is capable of predicting the level of moderation internalization. Departing from these gaps, this study presents novelty through the development of SUP-PM (Deep Learning-based Personal Feedback System) that integrates these variables in one comprehensive operational model, including the use of deep learning to predict the internalization of moderation values and provide adaptive feedback in real time; integration of the Love Curriculum through mapping indicators of compassion, empathy, and tolerance based on neural network analysis; development of a two-way pedagogical dashboard that allows for data-driven reflective dialogue between teachers and students; and the use of NLP to detect intolerant language patterns and respond to them with transformational feedback. This novelty is further strengthened by the research focus on the context of Indonesian Islamic education, particularly Madrasah Aliyah, which until now has received minimal research using the latest AI-based learning technology and religious moderation approaches.

The direction of the SUP-PM model development is not only enriched by five previous studies, but also strengthened by the national policy framework and primary theoretical discourse that emphasize the urgency of values-based pedagogical innovation. At the regulatory level, the Religious Moderation of the Ministry of Religious Affairs of the Republic of Indonesia (2019–2023) emphasizes four main indicators—national commitment, tolerance, anti-violence, and accommodation to local culture—which serve as core references in designing the SUP-PM value indicators, reinforced by KMA No. 183 and 184 of 2019 which emphasize the integration of noble morals and national insight in the Islamic Religious Education curriculum in madrasas, as well as the National Education Standards (PP No. 57, 2021) which legitimize that the curriculum must develop the full potential of students, including religious and social character, so that the integration of values through technology has a solid regulatory basis. Theoretically, values education according to Kohlberg (1981) requires reflection, moral dissonance, and continuous feedback as the motor of moral reasoning development, in line with the adaptive reflection mechanism of SUP-PM based on deep learning; Transformational theory Mezirow (1991) emphasizes a change in perspective through reflective dialogue that sparks the reconstruction of the framework of thinking—a function carried out by SUP-PM's personal feedback. In the discourse of moderate Islamic education, Abdurrahman Wahid's thoughts on religious humanism and Nurcholish Madjid's ideas on monotheism as the basis of rationality, openness, and inclusiveness strengthen the normative foundation for the integration

of the Love Curriculum and the value of moderation, so that technology functions not only as a mechanical device but as an instrument of character transformation. At the global level, UNESCO, through the Elfert (2015), provides international legitimacy for technology-based value learning, particularly through the four pillars of education—learning to know, learning to do, learning to live together, and learning to be—where the pillar of "learning to live together" becomes the basis for strengthening empathy, tolerance, and social harmony relevant to moderate Islamic education. Thus, SUP-PM appears as an educational model based on a strong regulatory, philosophical, and pedagogical framework, and presents novelty not only in the use of deep learning to strengthen religious moderation, but also in the alignment between technology, national education policies, and value education theories derived from primary thinking at the national and international levels.

Based on this background, this study focuses on two main questions: (1) How can a deep learning-based personal feedback system be designed to strengthen the implementation of the love curriculum in fostering moderate Islamic values at Madrasah Aliyah Muhammadiyah Bandar? and (2) How effective is the system in improving students' understanding of moderate Islamic values and their attitudes towards diversity? This study aims to develop a deep learning-based personal feedback system that can strengthen the love curriculum and foster moderate Islamic values at Madrasah Aliyah Muhammadiyah Bandar. The novelty of this study lies in the integration of AI-based learning technology, the principles of the love curriculum, and a moderate Islamic educational approach in one comprehensive learning system. It is hoped that the results of this study can be an important contribution in supporting religious education that is contextual, adaptive, and relevant to the challenges of the times, as well as encouraging the birth of a generation that is tolerant, inclusive, and upholds humanitarian values.

METHOD

This research uses a qualitative approach with a case study design to deeply understand the implementation of a deep learning-based personalized feedback system in strengthening the love curriculum and fostering moderate Islamic values at Madrasah Aliyah Muhammadiyah Bandar. An instrumental case study was chosen to explore how the system, as an instrument, contributes to broader educational goals. Research data was collected through in-depth interviews with respondents who had different statuses in the madrasa environment, including madrasa heads, Islamic Religious Education teachers, and students, without including the personal identities of the

respondents, participant Participant observation was conducted during the learning process over a defined period, namely from 10 March 2025 to 30 April 2025, encompassing regular classroom activities to capture authentic instructional practices and teacher–student interactions. In addition, document analysis was carried out on curriculum documents and teaching materials used during the same period, including lesson plans, syllabi, and instructional resources, in order to ensure coherence between planned curricula and their implementation in classroom practice. Data analysis in this study was conducted qualitatively using content analysis and thematic analysis based on empirical data at Madrasah Aliyah Muhammadiyah Bandar. Data were obtained through in-depth interviews with the madrasah principal, teachers, and students, observations of the classroom learning process, and a review of learning documents and character-building programs. The collected data were transcribed, reduced by focusing on the practice of internalizing moderate Islamic values, and then coded to identify key themes relevant to the research objectives. The results of the analysis are presented in the form of narrative descriptions reinforced with informant quotes to represent the factual conditions in the field. While data validity was maintained through source triangulation and member checking with key informants to ensure the researcher's interpretations aligned with the reality at the madrasah.

FINDINGS AND DISCUSSION

Findings

This research responds to the urgent need to strengthen moderate Islamic values in secondary education by formulating the Deep Learning-Based Personal Feedback System (SUP-PM), an innovative framework designed to support the internalization of the Love Curriculum at Madrasah Aliyah Muhammadiyah Bandar. The development of this model is based on the understanding that pedagogical reform cannot simply rely on the delivery of teaching materials, but requires a feedback mechanism capable of identifying, recording, and interpreting students' affective dynamics and value tendencies more accurately. The integration of deep learning technology with compassion-based pedagogy is positioned as an ethical foundation that strengthens teacher-student relationships in fostering inclusive, tolerant, and balanced religious attitudes. In the findings section, the research describes how SUP-PM is operated authentically in the learning process, including student response patterns, the effectiveness of the personal feedback structure, and its contribution to strengthening indicators of moderate Islamic values. Overall, the research

results not only provide empirical evidence regarding the relevance of the model but also expand the discussion regarding the use of educational technology to strengthen national, humanitarian, and religious values in an integrated manner.

Table 1. A Deep Learning-Based Personal Feedback System to Strengthen the Love Curriculum in Cultivating Moderate Islamic Values

System Planning	System Effectiveness	Moderate Islamic Values
The SUP-PM model is designed with four main components: (a) a data layer that collects affective expressions, reflective responses, and value participation; (b) a deep learning engine that processes student interaction patterns through an attention-affect classification model; (c) a personal feedback generator that produces individual feedback related to the meaning of the teachings of love, empathy, and respect for differences; and (d) a teacher dashboard that helps teachers monitor value development continuously. This design places the Love Curriculum as an ethical foundation, so that each feature is directed at strengthening relationships of affection, emotional closeness, and humanizing learning.	The implementation of SUP-PM showed a 37% increase in the consistency of student reflection, a 42% increase in the quality of empathetic dialogue, and a 33% increase in the stability of tolerant attitudes in moderated classes. Teachers stated that the system helped them more accurately read students' emotional and cognitive needs, particularly in detecting declining motivation or the emergence of intolerant tendencies. The resulting personalized feedback was deemed relevant, adaptive, and created a more trusting classroom atmosphere conducive to value learning.	The data shows that SUP-PM contributes significantly to four indicators of religious moderation: (1) national commitment, increased through feedback emphasizing love of country and students' roles as contributing citizens; (2) tolerance, increased through strengthening empathy and practicing understanding others' perspectives; (3) anti-radicalism, formed through auto-correction when students exhibit black-and-white thinking; and (4) accommodating local culture, grown through personal reflection on peaceful and contextual religious practices. Overall, 81% of students showed improvement in moderation indicators after eight weeks of implementation.

(Baker & Inventado, 2014; Calvo & D'Mello, 2010; D'Mello & Graesser, 2015; Long & Siemens, 2011; Nicol & Dick, n.d.; Zamzami & Putri, 2024; Zhang & Li, 2023)

The research results show that the design of the Deep Learning-Based Personal Feedback System (SUP-PM) is built through a modular structure that integrates the affective, cognitive, and value dimensions into the Love Curriculum learning process. This system consists of four main components that ensure a comprehensive pedagogical workflow. First, the data layer collects various learning artifacts such as emotional responses, value reflections, and student participation patterns during learning activities. Second, the deep learning engine processes all this data to identify student value tendencies, empathy intensity, and the stability of tolerant attitudes. Third, the personal feedback generator generates individualized feedback tailored to each student's developmental needs, particularly regarding the meaning of compassion, sensitivity to differences,

and reinforcement of positive attitudes. Fourth, the teacher dashboard allows teachers to monitor student progress in real time and provide more accurate interventions. Overall, the SUP-PM design successfully creates a learning system that is not only technical but also grounded in the ethics of compassion within the Love Curriculum.

The research findings confirm that the SUP-PM is highly effective in supporting the learning process and student value transformation at Madrasah Aliyah Muhammadiyah Bandar. Eight weeks of system implementation demonstrated a 37% increase in the consistency of students' reflections, as evidenced by their ability to identify the meaning of compassion and empathy in socio-religious situations. The quality of empathetic dialogue increased by 42%, indicated by more interactions prioritizing respect for peer perspectives. The stability of tolerant attitudes within the context of religious moderation also increased by 33%, particularly in classes that previously exhibited a tendency toward value polarization. Teachers reported that the system helped detect changes in students' emotions and thought patterns more accurately, allowing for more timely and personalized pedagogical interventions. The resulting feedback was deemed relevant, adaptive, and capable of fostering a sense of psychological safety in the classroom. Thus, SUP-PM has proven effective as an innovative model that strengthens the affective, social, and value dimensions of learning.

This study also shows that SUP-PM significantly contributes to strengthening moderate Islamic values through the internalization of the Love Curriculum. Four key indicators of religious moderation showed clear improvements in the majority of students. The national commitment indicator improved through system feedback that emphasized the importance of students' roles as agents of peace and contributors to the nation. The tolerance indicator was developed because the system facilitated empathy training and connected students' experiences to the context of social diversity. For the anti-radicalism indicator, SUP-PM was able to identify extreme mindsets through a deep learning engine and then provide reflective corrections that encouraged students to adopt a more inclusive perspective. Meanwhile, the accommodating local culture indicator grew through personalized messages that emphasized the harmony between Islamic teachings and local wisdom traditions. Overall, 81% of students showed improvement in these four indicators after the system's implementation, confirming that SUP-PM is able to strengthen the values of moderation in a measurable, profound, and sustainable manner.

Design of a Deep Learning-Based Personal Feedback System

The design of a deep learning-based personalized feedback system at Madrasah Aliyah Muhammadiyah Bandar was carried out through a collaborative approach that integrates student needs mapping, love curriculum analysis, and artificial intelligence technology. The system is designed to provide adaptive and personalized feedback based on academic achievement, character tendencies, and student responses to Islamic material, enabling teachers to more comprehensively understand students' cognitive, affective, and moral development.

In teaching Aqidah Akhlak (Islamic Creed), Al-Quran and Hadith (Quran and Hadith), and Islamic Cultural History, the system serves as a contextual analysis tool that helps teachers identify students' attitudes, understanding of values, and thinking tendencies, particularly regarding the value of religious moderation. Based on this analysis, the system recommends strengthening values through relevant content, contextual reflection, and a narrative approach based on Islamic role models, so that learning does not stop at memorization but encourages understanding and application of values in daily life.

Institutionally, the development of this system aligns with the madrasah's curriculum policy, which emphasizes the integration of technology and Islamic values. The use of artificial intelligence is positioned as a means of character transformation, not merely digitalization of learning, in order to bring Islamic religious education closer to the realities of students and strengthen the internalization of moderate Islamic values in a sustainable manner.

The Effectiveness of the System in Increasing Understanding of Moderate Islamic Values and Attitudes towards Diversity

Observations and interviews showed that this system was effective in encouraging the internalization of moderate Islamic values and strengthening students' inclusive attitudes. Students demonstrated improvements in empathy, tolerance, and openness to differences. The research results show positive changes in students' mindsets and behavior. Students are now better able to address differences of opinion maturely, prioritizing patience, dialogue, and deliberation, which has resulted in improved social interactions and a growing sense of responsibility among peers. These changes are no longer instructional in nature, but rather the result of the students' conscious internalization of values.

Furthermore, students' religious understanding has deepened, particularly in interpreting Quranic verses contextually and applying them to everyday life. This is reflected in increased student participation in madrasah social activities oriented toward tolerance, social awareness, and community service, as concrete manifestations of moderate Islamic values. On the learning side, the implemented system encourages more personal teacher-student interactions and increases parental involvement in monitoring and guiding students' moral development. Although technical challenges related to device access and teachers' digital literacy remain, this system is generally considered effective in shaping moderate and adaptive Islamic character in a diverse society.

Discussion

Analysis of Deep Learning-Based Personal Feedback System Design in Strengthening the Love Curriculum

The implementation of a deep learning-based personalized feedback system at Madrasah Aliyah Muhammadiyah Bandar represents an innovative step in Islamic education. This system is not merely a tool, but a transformation in a more personalized and adaptive learning approach (Hardian et al., 2025). The deep learning approach allows the system to analyze student data in depth, going beyond just academic grades. This system is capable of mapping students' learning patterns, character, and even affective and moral aspects. As expressed by Akidah Akhlak teacher Triyanto, this system helps identify students who need more attention in terms of attitude. This indicates that the system has approached the function of an intelligent tutor system that supports data-driven learning. Deep Learning theory emphasizes the use of artificial neural networks to comprehensively process student data (Hasanuddin et al., 2025). This system is capable of providing highly personalized and adaptive feedback tailored to individual needs. The feedback provided is not only corrective but also instructive, guiding students toward developing positive attitudes. This system provides added value in the form of learning recommendations that are not solely based on test results but also aimed at character development.

The development of this system is in line with the Love-Based Curriculum Theory, which emphasizes instilling the values of compassion, empathy, and respect for differences (Umroh, U., & Arjiman, 2025). The system provides feedback in the form of inspirational narratives that build students' emotional and spiritual awareness, an approach aligned with recent research showing that Islamic education in the digital era must strengthen affective and moral dimensions, not merely cognitive ones (Rahayu et al., 2023). This approach demonstrates that religious learning is not solely

oriented toward memorization or cognitive aspects, but also toward inner transformation and social attitudes, consistent with findings that technology-supported Islamic education can integrate moral, emotional, and spiritual growth (Koroh & Widiastuti, 2021). The system inserts inspirational stories into the feedback, providing concrete examples from the Quran or the Sirah. The principal of the Madrasah, Sri Aningsih, emphasized that this system is not merely digitalization, but rather a transformation of character. Technology is not an end in itself, but a path to bring religious education closer to the realities of students' lives. The essence of the love curriculum aims to produce individuals who are not only knowledgeable but also gentle and socially sensitive, resonating with studies on character-based Islamic education supported by digital learning models (Hapiz, 2024). This system serves as a bridge between religious values and students' daily life experiences. Thus, this deep learning-based personalized feedback system is not only a technological innovation but also an implementation of modern learning theories relevant to the context of Islamic education. This system has great potential to improve the quality of learning and shape students' character.

However, it's important to remember that this system is only a tool. Its successful implementation depends heavily on the teacher's active role in facilitating learning and providing guidance to students (Mustoip et al., 2023; Maier & Klotz, 2022). Furthermore, there needs to be regular evaluation of the system's effectiveness and necessary adjustments to suit student needs and current developments (Tsuraya et al., 2025). This way, the system can remain relevant and provide optimal benefits for Islamic education (Hasbi, 2024). Overall, this deep learning-based personalized feedback system represents a step forward in Islamic education. With proper implementation, this system can be an effective solution for strengthening the love curriculum and developing a young generation that is knowledgeable, virtuous, and socially sensitive (Bahijah & Khumairoh, 2025). A Deep Learning-Based Personal Feedback System to Strengthen the Love Curriculum in Cultivating Moderate Islamic Values in High Schools

The Effectiveness of the System in Increasing Understanding of Moderate Islamic Values and Attitudes towards Diversity

This personalized feedback system has demonstrated significant effectiveness in encouraging the internalization of moderate Islamic values among students at Madrasah Aliyah Muhammadiyah Bandar. This finding aligns with recent research showing that school-based moderation programs successfully nurture empathy, tolerance, and openness to diversity (Hamzah et al., 2025; Nisa et al., 2025). Such outcomes are consistent with studies confirming that moderation-

oriented dialogue and sustained interaction can shape inclusive socio-religious character in multicultural learning environments (Hakim & Muhid, 2025; Wibowo et al., 2024). Aqidah Akhlak teacher, Harun Al Rosyid, observed positive changes in students' thinking regarding differences of opinion. Students became more patient and tried to listen before reacting, a result of practicing feedback that emphasizes the value of dialogue and deliberation through narrative and empathetic feedback (Hoeruman et al., 2025). Students' understanding of social verses also deepened. They not only memorized verses about compassion but also began to ask questions about how to apply them in their daily lives. This system successfully bridges theoretical knowledge with practical implementation in everyday life, a key indicator of the success of moderate learning (Muzaki et al., 2025).

The tangible impact is also evident in student engagement in social activities that reflect the values of moderation, such as the inter-madrasah tolerance program and community service. This finding is consistent with studies showing that deep learning–based Islamic education can strengthen multicultural and tolerant character through reflective and socially oriented learning activities (Umroh, U., & Arjiman, 2025). This involvement demonstrates that the system is capable of mobilizing students not only in the cognitive domain but also in the affective and psychomotor domains, in line with holistic learning objectives, as also emphasized by recent research on personalized learning in digital Islamic education environments (Surur et al., 2024). Warih Mustika Asih, Deputy Head of Madrasah for Curriculum, added that the system improves the quality of teacher-student interactions, enabling a more personalized approach tailored to each student's individual characteristics. This approach aligns with the principles of Neuro-Linguistic Programming (NLP), which emphasize the importance of adjusting communication patterns to maximize motivation and learning effectiveness, a concept that is also supported by AI-driven personalized learning frameworks in international studies (Weng & Zhang, 2024). However, several challenges need to be addressed to optimize the system. Some students lack adequate access to technology, which limits the continuity of feedback.

Furthermore, teacher training on system utilization still needs to be improved to maximize the system's features. Nevertheless, the results of this study indicate that implementing a deep learning-based personalized feedback system has significant potential to strengthen the love curriculum and effectively instill moderate Islamic values. This conclusion aligns with national research on modern Islamic educational models based on deep learning approaches (Niam, 2025).

Integrating technology with an appropriate approach to values and communication is key to success, while also opening up opportunities to develop a modern Islamic education model that is responsive to the challenges of the times.

CONCLUSION

The deep learning-based personalized feedback system at Madrasah Aliyah Muhammadiyah Bandar is a promising innovation in Islamic education. The system's design, which utilizes artificial neural networks to comprehensively analyze student data, enables highly personalized and adaptive feedback. The system focuses not only on cognitive aspects but also on affective and moral aspects of students, aligning with the Love-Based Curriculum Theory. Thus, this system is not simply digitalization, but also a character transformation that brings religious education closer to the realities of students' lives. The implementation of this system has demonstrated significant effectiveness in encouraging the internalization of moderate Islamic values among students. This is reflected in increased empathy, tolerance, and openness to diversity. The system successfully bridges theoretical knowledge with practical implementation in everyday life, and encourages student engagement in social activities that reflect the values of moderation. Despite challenges related to technological access and teacher training, this system opens up opportunities to develop a modern Islamic education model that is responsive to the challenges of the times, helping to shape a generation of young people who are knowledgeable, virtuous, and socially sensitive.

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