Solo International Collaboration and Publication of Social Sciences and Humanities
E-ISSN: 2988-3512
Vol.4, No.3, 2026, pp. 1177-1190
DOI: https://doi.org/10.61455/sicopus.v4i03.654

Received	Revised	Accepted
June 05, 2026	September 30, 2026	October 20, 2026

Innovative Islamic Religious Education Model Integrating Love Based and Deep Learning for SDGs in Madrasah Aliyah

***Bayu Ardiwansyah*[1*], *Iswati*[2], *Saifudin Amin*[3], *Cahaya Khaeroni*[4]**

[1,2,4]Universitas Muhammadiyah Metro, Lampung, Indonesia

[3]Muhammadiyah Islamic College, Singapore

[1*]bayuardiwansyah@ummetro.ac.id, [2]iswati@ummetro.ac.id,
[3]saifuddin@muhammadiyah.org.sg, [4]cahayakhaeroni@ummetro.ac.id

Abstract

Objective: This study aims to develop and test an innovative Islamic Religious Education (IRE) learning model that integrates the Love Based Curriculum (Kurikulum Berbasis Cinta) and deep learning to support the achievement of the Sustainable Development Goals (SDGs) in Madrasah Aliyah in Metro City, Indonesia. **Theoretical framework:** The model is grounded in the pedagogy of love and the ethics of care, deep learning theory with its mindful, meaningful, and joyful principles, Islamic ecotheology, and Education for Sustainable Development under SDG target 4.7. **Literature review:** Previous studies have examined the Love-Based Curriculum, deep learning, and the contribution of Islamic education to the SDGs largely in isolation. Studies combining the first two remain conceptual or limited to teacher assistance, and none offers an operational IRE learning syntax that is explicitly linked to SDG targets at the senior secondary madrasah level. **Method:** A research and development design following the ADDIE model was carried out in three Madrasah Aliyah. Data were gathered through needs questionnaires, interviews, expert validation sheets, practicality questionnaires, a deep understanding test, and a sustainability-oriented Panca Cinta character scale. They were analysed using Aiken's V, percentage scores, normalised gain, independent t-tests, effect sizes, and interactive qualitative analysis. **Results:** The study produced the CINTA-SDGs model with five phases: contemplate mindfully, inquire meaningfully, nurture collaborative reasoning, take sustainable action, and appreciate and reflect (muhasabah). The model was rated valid by experts, practical by teachers and students, and more effective than conventional learning in improving students' deep understanding and sustainability-oriented character. **Implications:** The findings give teachers, madrasah principals, and policymakers an operational pathway for implementing KMA 1503 of 2025 that connects love-based values, deep learning, and local sustainability issues, and they encourage SDG-oriented action projects within IRE subjects. **Novelty:** The originality of this study lies in a single learning syntax that maps every phase simultaneously to deep learning experiences, the five Panca Cinta values, and specific SDG targets. This positions Islamic Religious Education in the madrasah as a transformative contributor to sustainable development rather than a merely normative subject.

Keywords: love-based curriculum, deep learning, islamic religious education, sustainable development goals, madrasah aliyah

*Corresponding Author: bayuardiwansyah@ummetro.ac.id

This work is licensed under a Creative Commons Attribution 4.0 International License (CC BY 4.0).

INTRODUCTION

The 2030 Agenda for Sustainable Development places education at the heart of every development goal. Target 4.7 of the Sustainable Development Goals (SDGs) specifically requires that all learners acquire the knowledge and skills needed to promote sustainable development, including through education for sustainable lifestyles, human rights, a culture of peace, global citizenship, and appreciation of cultural diversity [1]. UNESCO has translated this target into the Education for Sustainable Development (ESD) framework, which addresses cognitive, socio-emotional, and behavioural learning objectives simultaneously [2], and has reinforced it through the ESD for 2030 roadmap, which calls for transforming learning rather than merely adding content [3]. Education for sustainability therefore requires systems thinking, anticipatory, normative, strategic, and interpersonal competencies [4], [5], which can only develop through learning that changes how students see the world [6].

Islamic education possesses strong value resources for taking on this role. The concepts of tawhid (the oneness of God), amanah (trust), khalifah (stewardship), and the prohibition against causing corruption on earth provide an ethical foundation for ecological and social awareness [7], [8]. A recent systematic review shows that publications on integrating Islamic Religious Education (IRE) with the SDGs have grown steadily since 2019, with integration indicators spanning epistemological-philosophical, pedagogical-practical, and institutional-structural domains [9]. Other studies confirm that the values of justice, social responsibility, and environmental care in Islamic education are aligned with the sustainable development agenda [10], [11]. Ecotheological practices among Muslim organisations and pesantren in Indonesia likewise demonstrate that religious values can mobilise climate mitigation and adaptation efforts [12], [13]. However, most of these studies remain at the conceptual or institutional level and have not yet reached the level of classroom learning syntax.

At the same time, the madrasah curriculum has undergone an important reform. Through Ministerial Decree (KMA) No. 1503 of 2025, the Ministry of Religious Affairs revised the curriculum implementation guidelines for madrasahs by introducing the Love-Based Curriculum (LBC; Kurikulum Berbasis Cinta) and deep learning [14]. The technical guidelines position five Panca Cinta values, namely love for Allah and His Messenger, love of knowledge, love of the environment, love of self and others, and love of the homeland, as the spirit of learning across all subjects [15]. In general education, the government has likewise adopted deep learning based on three principles, namely mindful, meaningful, and joyful learning, with three learning experiences: understanding, applying, and reflecting [16], [17]. Together, these policies open a significant opportunity for IRE to move away from memorisation-dominated instruction towards learning that engages the heart, the mind, and action [18].

Empirical studies on the LBC have begun to emerge. Research in Islamic primary and junior secondary madrasahs shows that the LBC improves classroom climate, increases engagement, and fosters discipline and tolerance among students [19], [20]. Conceptual work has also highlighted the potential of the LBC for multicultural IRE [21]. Nevertheless, madrasah teachers' readiness to adopt the LBC varies, particularly in designing lesson plans and assessments [22]. Efforts to combine the LBC with deep learning have so far appeared only as a qualitative case study in a state Madrasah Aliyah [23] and as a teacher assistance program in Islamic primary schools [24]. Neither study has produced a learning model tested for validity, practicality, and effectiveness, and neither explicitly links learning to SDG targets.

The Madrasah Aliyah level holds a strategic position in this agenda. Its students are in late adolescence, a stage marked by identity formation, the consolidation of values, and preparation for social roles. Learning that engages them with real problems and

E-ISSN: 2988-3512
Copyright © 2026 Authors

provides space for collaboration and reflection has the potential to shape lasting competencies and character [25], [26]. IRE in Madrasah Aliyah, which comprises Qur'an and Hadith, Islamic Creed and Ethics (Akidah Akhlak), Islamic Jurisprudence (Fikih), and Islamic Cultural History, offers wide room to connect religious teachings with issues of the environment, social justice, peace, and citizenship.

In Metro City, Lampung, state and private Madrasah Aliyah have begun implementing the LBC, yet preliminary observations indicate that IRE learning remains largely teacher-centred, emphasises conceptual mastery, and is seldom connected to real issues in students' surroundings, such as waste management, water conservation, bullying, and digital ethics. A similar pattern has been reported among Islamic Education teachers in Malaysia, who still integrate environmental issues in a teacher-centred manner [27]. Yet teacher quality and instructional design are key to achieving SDG 4 [28]. This gap is the starting point of the present study.

This study aims to (1) analyse the needs for Islamic Religious Education (IRE) learning that integrates the Love-Based Curriculum (LBC), deep learning, and the SDGs in Madrasah Aliyah in Metro City; (2) develop an IRE learning model based on this integration; and (3) test its validity, practicality, and effectiveness. The novelty lies in one learning syntax that links each phase to deep learning principles, Panca Cinta values, and specific SDG targets. Theoretically, it connects religious values with sustainability goals. Practically, it gives teachers a ready-to-use syntax that helps IRE contribute to sustainable development.

LITERATURE REVIEW

The Love-Based Curriculum and the Pedagogy of Love

The LBC is a madrasah curriculum paradigm that positions love as the foundation of pedagogical relationships, content, and the learning atmosphere. Philosophically, this idea is consistent with the concept of Islamic education as the inculcation of adab that forms the whole person [29]. In contemporary pedagogy, learning grounded in care and warm relationships is a prerequisite for openness, a sense of safety, and motivation to learn [30], [31]. Alhamuddin and colleagues describe the LBC as an effort to reimagine the madrasah curriculum through a pedagogy of love that balances the spiritual, emotional, and social dimensions of learners. Teachers with strong social and emotional competence have also been shown to build prosocial classrooms that support learning outcomes [32].

The Panca Cinta values are essentially a framework for character education. Effective character education requires the integration of moral knowing, moral feeling, and moral action [33] and is delivered through evidence-based strategies such as cooperative learning, moral discussion, and community service [34]. A meta-analysis of school-based social and emotional learning programs likewise reports positive effects on attitudes, prosocial behaviour, and academic achievement. These findings support the assumption that the values of love must be brought to life through structured learning experiences rather than merely transmitted.

Deep Learning

The term deep learning in education is rooted in the distinction between surface and deep approaches to learning, that is, between learning to remember and learning to understand meaning [35]. Biggs and Tang emphasise that a deep approach emerges when objectives, activities, and assessment are aligned to demand higher-order understanding [36]. Fullan, Quinn, and McEachen later expanded this into a deep

E-ISSN: 2988-3512
Copyright © 2026 Authors

learning framework that develops global competencies, namely character, citizenship, collaboration, communication, creativity, and critical thinking, through pedagogical practices, learning partnerships, learning environments, and leveraging digital technology. In Indonesia, deep learning is formulated around three principles, namely mindful, meaningful, and joyful learning, and three learning experiences: understanding, applying, and reflecting [37].

Cognitive research supports this formulation. The ICAP framework shows that constructive and interactive engagement produces better understanding than passive engagement [38]. A synthesis of learning strategies indicates that transferring knowledge to new situations requires deliberate stages of deepening and application [39]. On the affective side, secondary students' engagement increases when the challenge and relevance of tasks are balanced with their skills [40]. The reflection stage, meanwhile, is consistent with transformative learning theory, which emphasises changes in frames of reference through critical reflection.

In the Islamic tradition, the idea of deep learning has rich equivalents. The Qur'an repeatedly invites people to engage in tafakkur (contemplating creation), tadabbur (pondering the meaning of the verses), and ta'aqqul (using reason), all of which require cognitive and spiritual engagement at once [41]. Deep learning therefore need not be regarded as a foreign concept for IRE but rather as a modern pedagogical language for reviving a reflective learning tradition. This convergence underpins the design of the model's opening and closing phases, namely contemplation and muhasabah (self-reflection).

Islamic Religious Education, Ecotheology, and the SDGs

Education for sustainable development requires learning that is action-oriented, interdisciplinary, and value-based. In the context of Islamic education, ecotheology provides a bridge between faith and ecological responsibility: nature is regarded as a sign of God, and humans as stewards entrusted with its care [42]. An ecotheological curriculum model for Islamic higher education shows that the concepts of tawhid, khalifah, amanah, mizan (balance), and the prohibition of fasad (corruption) need to be built into learning outcomes, content, methods, and assessment so that sustainability does not become a mere add-on [43]. A study of an eco-pesantren likewise shows that everyday practices with religious meaning, such as farming and waste management, can serve as a living curriculum.

The review above reveals three points of convergence. First, the LBC provides the value orientation (why we learn), deep learning provides the mode of learning (how we learn), and the SDGs provide the context and targets for action (what we learn for). Second, all three call for learning that is active, collaborative, and reflective. Third, no IRE learning model yet brings the three together in an operational syntax. A complete learning model should include a syntax, a social system, principles of reaction, a support system, and instructional and nurturant effects [44]. This framework guided the design of the model in this study.

METHODOLOGY

This study employed a research and development design based on the ADDIE model, which comprises the analysis, design, development, implementation, and evaluation stages [45]. This design was chosen because it allows instructional products to be tested in stages and revised on the basis of data. Data collection and analysis followed a mixed-methods approach, using quantitative data to examine validity, practicality, and effectiveness and qualitative data to understand needs and the implementation process [46]. The research procedure is presented in Figure 1.

E-ISSN: 2988-3512
Copyright © 2026 Authors

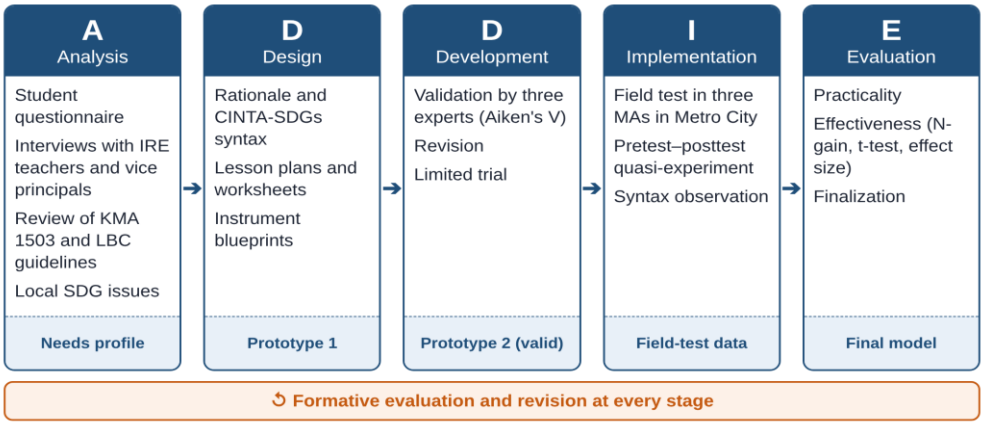


Figure 1. Model Development Procedure Using the ADDIE Approach

Figure 1 presents the model development procedure using the ADDIE approach, which consists of five stages: Analysis, Design, Development, Implementation, and Evaluation. Each stage produces a specific output that becomes the input for the next stage, and formative evaluation and revision are carried out throughout the process. Analysis. The researcher identifies the learning needs through a student questionnaire and interviews with IRE teachers and vice principals. The researcher also reviews KMA 1503 and the LBC guidelines and examines local SDG issues. This stage produces a needs profile. Design. Based on the needs profile, the researcher prepares the rationale and the CINTA-SDGs syntax. Lesson plans, worksheets, and instrument blueprints are also developed. The output of this stage is Prototype 1. Development. Three experts validate Prototype 1 using Aiken's V. The prototype is then revised and tried out on a limited basis. The output is Prototype 2, which is considered valid. Implementation. The model is field-tested in three Madrasah Aliyah in Metro City using a pretest–posttest quasi-experimental design. The implementation of the syntax is also observed. This stage produces field-test data. Evaluation. The researcher assesses the practicality of the model and its effectiveness using N-gain, t-test, and effect size. The model is then finalised, and the output is the final model.

The study was conducted in the even semester of the 2025/2026 academic year in three Madrasah Aliyah in Metro City, Lampung, that had implemented the LBC, namely one State Madrasah Aliyah (MAN) and two private Madrasah Aliyah. Participants in the needs analysis comprised 6 IRE teachers, 3 vice principals for curriculum, and 214 eleventh-grade students. The limited trial involved 32 students, while the field test involved 98 students in the experimental group and 94 students in the control group, selected by cluster random sampling at the class level. The model was validated by three experts: an IRE curriculum expert, an instructional design expert, and an expert in education for sustainable development.

The research instruments included (1) a needs analysis questionnaire and interview guide; (2) a model validation sheet covering the rationale, syntax, social system, principles of reaction, support system, effects, and assessment instruments; (3) practicality questionnaires for teachers and students; (4) a case-based essay test of deep understanding in IRE scored with an analytic rubric; and (5) a Likert-type scale of sustainability-oriented Panca Cinta character. The field-test content covered Qur'an and Hadith on preserving the environment (Q.S. Ar-Rum: 41 and Q.S. Al-A'raf: 56), Islamic jurisprudence on ritual purification (thaharah) and water conservation, and Islamic Creed and Ethics on tolerance and anti-bullying.

The content validity of the model was analysed using Aiken's V index with the following formula:

E-ISSN: 2988-3512
Copyright © 2026 Authors

$$V = \Sigma s / [n(c - 1)] \quad (1)$$

where s is the difference between the score given by a validator and the lowest possible score, n is the number of validators, and c is the number of rating categories. Values of V > 0.80 were classified as high validity, 0.40–0.80 as moderate, and below 0.40 as low. Practicality was analysed as the percentage of the obtained score relative to the maximum score, categorised as very practical (> 80%), practical (61–80%), fairly practical (41–60%), and less practical (≤ 40%). Effectiveness was analysed using the normalised gain [48]:

$$g = (S_{post} - S_{pre}) / (S_{max} - S_{pre}) \quad (2)$$

where S_{post} is the posttest score, S_{pre} the pretest score, and S_{max} the maximum score. A value of g ≥ 0.70 was classified as high, 0.30 ≤ g < 0.70 as medium, and g < 0.30 as low. Differences in N-gain between the experimental and control groups were tested using an independent samples t-test at the 0.05 significance level and complemented by Cohen's d effect size. Qualitative data from interviews and observations were analysed interactively through data condensation, data display, and conclusion drawing [47].

RESULTS AND DISCUSSION

Needs Analysis

The needs analysis revealed three main findings. First, 71.5% of students reported that IRE learning was still dominated by lectures and memorisation, and 64.0% of students stated that IRE content was rarely connected to environmental or social issues around them. Second, five of the six teachers had attended LBC socialisation sessions, but only two teachers had designed lesson plans based on deep learning principles, and none had explicitly linked learning objectives to SDG targets. Third, interviews with vice principals identified sustainability issues close to students' lives, namely plastic waste management in the canteen, wasteful use of water for ablution, verbal bullying, and social media ethics. These findings are consistent with reports that teacher readiness is the main challenge in implementing the LBC and confirm the need for a model that provides step-by-step guidance [48].

Design of the CINTA-SDGs Model

Drawing on the needs analysis and the theoretical review, the CINTA-SDGs model was designed with five phases. The name of the model is an acronym of its phases and, since cinta means love in Indonesian, it also signals love as the spirit of learning. The structure of the model is presented in Figure 2, and the integration of each phase is detailed in Table 1.

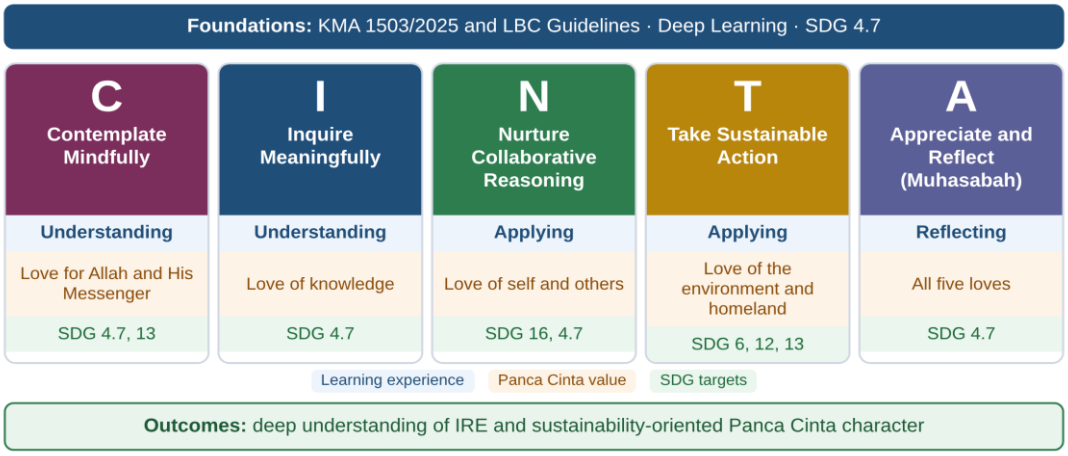


Figure 2. The CINTA-SDGs Islamic Religious Education Learning Model

Copyright © 2026 Authors

Table 1. Integration of the CINTA-SDGs Phases with Deep Learning, Panca Cinta, and the SDGs

Phase	Core Activities	Deep Learning	Panca Cinta Value	SDG Targets
Contemplate Mindfully	Tafakkur on local phenomena; linking them to Qur'anic verses or hadith; setting learning intentions	Mindful; understanding	Love for Allah and His Messenger	4.7; 13
Inquire Meaningfully	Formulating essential questions; examining exegesis, hadith, and local data	Meaningful; understanding	Love of knowledge	4.7
Nurture Collaborative Reasoning	Heterogeneous group dialogue; weighing perspectives empathetically; formulating solutions	Meaningful; applying	Love of self and others	16; 4.7
Take Sustainable Action	Designing and carrying out small actions in the madrasah, family, or community	Joyful; applying	Love of the environment; love of the homeland	6; 12; 13
Appreciate and Reflect	Exhibition of work; muhasabah journal; authentic assessment feedback	Joyful; reflecting	All five loves	4.7

The CINTA-SDGs learning model consists of five sequential phases: Contemplate Mindfully, Inquire Meaningfully, Nurture Collaborative Reasoning, Take Sustainable Action, and Appreciate and Reflect. Each phase combines three elements at the same time: the core learning activities, the principles and experiences of deep learning, and the Panca Cinta value that students are expected to develop. Each phase is also linked to specific SDG targets, so every step of the lesson contributes to a sustainability goal.

Table 1 shows how these elements are integrated. The lesson moves students from mindful and meaningful understanding, through application, to joyful reflection. The Panca Cinta values grow from love for Allah and His Messenger to love for the environment and the homeland, and finally to all five loves at the closing phase. The SDG targets focus on quality education (4.7), climate action (13), peace and strong institutions (16), clean water (6), and responsible consumption (12).

The Contemplate Mindfully phase opens the lesson with tafakkur on a real phenomenon, such as a photograph of piled-up waste around the madrasah, which is then linked to a Qur'anic verse or hadith. This phase brings the mindful principle to life and nurtures love for Allah through the awareness that nature is a trust. The Inquire Meaningfully phase invites students to formulate essential questions and examine exegesis, hadith, and local data. The Nurture Collaborative Reasoning phase trains students to engage in dialogue within heterogeneous groups, weighing different perspectives respectfully and empathetically. The Take Sustainable Action phase turns understanding into small, measurable actions, such as a water-saving ablution campaign, a class waste bank, or an anti-bullying movement. The Appreciate and Reflect phase closes the lesson with a celebration of students' work, self-reflection (muhasabah), and authentic assessment feedback.

As an illustration, in a Qur'an and Hadith lesson on preserving the environment, the teacher opens by showing a photograph of plastic waste in the madrasah canteen and inviting students to pause and reflect on Q.S. Ar-Rum: 41 (Contemplate). Students then examine the

E-ISSN: 2988-3512
Copyright © 2026 Authors

exegesis of the verse and collect simple data on the daily volume of waste at the madrasah (Inquire). In groups, they discuss the causes of the problem from the perspectives of students, canteen vendors, and cleaning staff, and agree on solutions (Nurture). The groups then act, for example, by running a two-week campaign of bringing their own food containers, and record its impact (Take action). The lesson concludes with an exhibition of the results, a muhasabah journal on changes in students' own attitudes, and rubric-based feedback (Appreciate and Reflect).

The social system of the model is dialogical and egalitarian, with the teacher acting as a murabbi (nurturing educator) who guides rather than merely transmits content. The principles of reaction emphasise empathetic, appreciative, and intellectually challenging responses. The support system includes lesson plans, student worksheets, muhasabah journals, and authentic assessment rubrics. The instructional effect of the model is a deep understanding of IRE content, while its nurturant effect is sustainability-oriented Panca Cinta character [49].

Validity of the Model

The results of validation by three experts are presented in Table 2. All aspects obtained Aiken's V values between 0.81 and 0.92, with a mean of 0.86, indicating that the model has high content validity.

Table 2. Expert Validation of the CINTA-SDGs Model

Aspect Assessed	Aiken's V	Category
Rationale and theoretical foundation	0.89	High
Syntax (five phases)	0.86	High
Social system	0.83	High
Principles of reaction	0.81	High
Support system (lesson plans, worksheets, muhasabah journal)	0.86	High
Instructional and nurturant effects	0.92	High
Assessment instruments	0.83	High
Mean	0.86	High

The experts suggested several improvements, including clarifying the indicators linking each phase to SDG targets, allocating more time to the Take Sustainable Action phase, and simplifying the muhasabah rubric so that teachers can use it easily. These suggestions were addressed before the limited trial, which in turn led to minor revisions of the wording of the worksheets and the division of roles within groups.

Practicality of the Model

The practicality questionnaires showed that the model was rated very practical by teachers (88.6%) and by students (84.9%). Teachers considered the syntax easy to follow and helpful in translating the LBC into concrete instructional steps. Students found the lessons more enjoyable because they could see a direct connection between religious teachings and the problems around them. Observations showed an average syntax implementation rate of 91.3%. The phase that was most difficult to implement was the Take Sustainable Action phase, owing to limited face-to-face time, so some actions were continued as projects outside class hours.

E-ISSN: 2988-3512
Copyright © 2026 Authors

Effectiveness of the Model

The results of the effectiveness test are presented in Table 3. For deep understanding, the experimental group achieved an N-gain of 0.60 (medium), whereas the control group achieved 0.28 (low). For sustainability-oriented Panca Cinta character, the N-gain of the experimental group was 0.55 (medium), whereas that of the control group was 0.21 (low).

Table 3. Pretest, Posttest, and N-gain Scores of the Experimental and Control Groups

Variable	Group	n	Pretest M (SD)	Posttest M (SD)	N-gain (Category)
Deep understanding of IRE	Experimental	98	48.6 (9.8)	79.4 (8.7)	0.60 (Medium)
	Control	94	49.1 (10.2)	63.5 (9.5)	0.28 (Low)
Sustainability-oriented Panca Cinta character	Experimental	98	61.2 (8.4)	82.7 (7.1)	0.55 (Medium)
	Control	94	60.8 (8.9)	68.9 (8.2)	0.21 (Low)

Note: scores converted to a 0–100 scale.

The independent samples t-test showed that the N-gain of the experimental group was significantly higher than that of the control group for both deep understanding ($t(190) = 9.84$, $p < 0.001$, $d = 1.42$) and sustainability-oriented Panca Cinta character ($t(190) = 8.37$, $p < 0.001$, $d = 1.21$). Both effect sizes are large. The CINTA-SDGs model is therefore effective in improving students' deep understanding and character compared with conventional learning.

Discussion

The findings show that the LBC and deep learning can be integrated operationally and reinforce each other. The Contemplate Mindfully phase brings together the mindful principle and the tradition of tafakkur, directing students' attention towards meaning rather than memorisation from the outset. This is in line with evidence that a deep approach to learning emerges when learners are oriented towards meaning [50], [51]. The Inquire Meaningfully and Nurture Collaborative Reasoning phases create constructive and interactive engagement, which, according to the ICAP framework, produces stronger understanding, while also developing the interpersonal and normative competencies required in sustainability education.

The improvement in sustainability-oriented character can be explained by the Take Sustainable Action and Appreciate and Reflect phases. Real action allows students to practise values rather than merely know them, as emphasised in research-based character education. Reflection through muhasabah encourages changes in frames of reference, as described by transformative learning theory, while a warm and appreciative classroom climate strengthens engagement and prosocial behaviour [52]. These findings extend the qualitative studies by Sriati and colleagues and by Zuhri and Maftucha by providing quantitative evidence of the effectiveness of integrating the LBC and deep learning in Madrasah Aliyah.

In terms of its contribution to the SDGs, the model translates target 4.7 into concrete and contextual IRE classroom practice. Local issues such as waste, water, and bullying are connected to SDGs 6, 12, 13, and 16, enabling students to see that religious teachings are directly relevant to sustainability. This approach responds to the recommendation that the integration of IRE and the SDGs should move from the conceptual to the pedagogical-

E-ISSN: 2988-3512
Copyright © 2026 Authors

practical domain and is consistent with ecotheological curriculum models that place sustainability at the core of Islamic education [53]. The model also shows that the Panca Cinta values, especially love of the environment and love of others, can serve as an ethical entry point for education for sustainable development.

The study also revealed several implementation challenges. Limited lesson hours meant that the Take Sustainable Action phase could not always be completed in class, so it needs to be integrated with co-curricular activities or cross-subject projects. Character assessment requires teachers to combine observation, muhasabah journals, and peer assessment rather than relying on a single data source. In addition, the success of sustainability actions depends heavily on the support of madrasah principals, families, and the surrounding community. These challenges are consistent with findings that IRE teachers need ongoing pedagogical support to integrate environmental education in a student-centred way and that teacher readiness is a key factor in the success of the LBC [54].

The practical implications of this study operate at three levels. For teachers, the CINTA-SDGs model offers a syntax that can be applied directly in Qur'an and Hadith, Islamic Creed and Ethics, Islamic Jurisprudence, and Islamic Cultural History. For madrasah principals, the model can serve as a reference for programs that strengthen the implementation of KMA 1503 of 2025 through teacher learning communities. For policymakers, the findings point to the need for teacher professional development focused on value-based deep learning design, in line with evidence that teacher quality determines progress towards SDG 4 [55], [56].

This study has several limitations, namely its coverage of three madrasahs in a single city, the relatively short duration of the field test, and the partial reliance on self-reported measures of character. Future research should employ longitudinal designs, broader geographical coverage, and more diverse behavioural measures. Ultimately, integrating love-based pedagogy with deep learning can help madrasahs cultivate compassionate, reflective graduates, thereby offering a replicable pathway for advancing sustainable development through Islamic education across diverse educational contexts in Indonesia and beyond.

CONCLUSION

This study produced the CINTA-SDGs innovative IRE learning model, which integrates the Love-Based Curriculum and deep learning to support the achievement of the SDGs in Madrasah Aliyah in Metro City. The model consists of five phases: Contemplate Mindfully, Inquire Meaningfully, Nurture Collaborative Reasoning, Take Sustainable Action, and Appreciate and Reflect. Each phase is explicitly mapped to the principles and experiences of deep learning, the Panca Cinta values, and SDG targets. The model was found to be valid according to experts, very practical according to teachers and students, and effective in improving deep understanding and sustainability-oriented Panca Cinta character, with large effect sizes. These findings confirm that IRE in the madrasah can act as a driver of education for sustainable development rather than a merely normative subject. Madrasahs are encouraged to adopt the model by strengthening teacher capacity, allocating time for action projects, and building partnerships with families and the community.

Acknowledgments

The authors sincerely thank the principals, Islamic Religious Education teachers, and students of Madrasah Aliyah in Metro City for their participation, and Universitas Muhammadiyah Metro for its valuable institutional support.

Author Contribution

Bayu Ardiwansyah conceptualized the study and drafted the manuscript. Iswati designed the methodology. Saifudin Amin conducted data analysis. Cahaya Khaeroni supervised, reviewed, and approved the final manuscript.

E-ISSN: 2988-3512
Copyright © 2026 Authors

Conflicts of Interest

The authors declare no conflicts of interest. No financial, personal, or professional relationships influenced the research design, data collection, analysis, interpretation of findings, or the decision to publish this manuscript.

Use of Artificial Intelligence (AI)

The authors used AI tools solely for language editing and grammar improvement. All scientific content, analysis, and conclusions were developed, verified, and approved by the authors, who take full responsibility for the manuscript.

Funding

This research, titled "Innovative Islamic Religious Education Model Integrating Love-Based and Deep Learning for SDGs in Madrasah Aliyah," was funded by Universitas Muhammadiyah Metro through its internal research grant scheme.

REFERENCES

[1] A. E. J. Wals, Y. Mochizuki, and A. Leicht, "Critical case studies of non-formal and community learning for sustainable development," *Int. Rev. Educ.*, vol. 63, no. 6, pp. 783–792, Dec. 2017, https://doi.org/10.1007/s11159-017-9691-9.

[2] H. G. Huynh and T. H. Nguyen, "Education for Sustainable Development Awareness, Attitudes, and Actions: A Quantitative Study of In-service Teachers in Vietnam," *Vietnam J. Educ.*, pp. 60–70, May 2026, https://doi.org/10.52296/vje.2026.856.

[3] M. O'Grady, "Transformative education for sustainable development: A faculty perspective," *Environ. Dev. Sustain.*, vol. 27, no. 9, pp. 20745–20761, Jul. 2025, https://doi.org/10.1007/s10668-023-03609-y.

[4] A. Redman and A. Wiek, "Competencies for Advancing Transformations Towards Sustainability," *Front. Educ.*, vol. 6, Nov. 2021, https://doi.org/10.3389/feduc.2021.785163.

[5] J. J. Salovaara, K. Soini, and J. Pietikäinen, "Sustainability science in education: analysis of master's programmes' curricula," *Sustain. Sci.*, vol. 15, no. 3, pp. 901–915, May 2020, https://doi.org/10.1007/s11625-019-00745-1.

[6] I. Fouche, "'Stop Bombarding Us With Work We Don't Even Need': Reconceptualising a First-Year Course for Increased Relevance Through Action Learning," *Educ. Res. Soc. Chang.*, vol. 11, no. 2, pp. 76–91, Oct. 2022, https://doi.org/10.17159/2221-4070/2021/v11i2a5.

[7] Imran Hayat et al., "The Role of Islamic Environmental Ethics in the Alleviation of Climate Challenges and the Preservation of Ecosystem," *Russ. Law J.*, vol. 11, no. 11s, May 2023, https://doi.org/10.52783/rlj.v11i11s.1967.

[8] S. Qamariah, M. Ilyasin, and B. Bahrani, "Integrating Ecotheology into Islamic Education: A Multicultural Perspective Study among Kindergarten Students," *Din. Ilmu*, vol. 25, no. 2, Dec. 2025, https://doi.org/10.21093/di.v25i2.13027.

[9] B. Efendi, Happy Susanto, Nuraini, Mokmin Bin Basri, and Muh Samsuri, "Integrating Islamic Religious Education for SDGs: A Systematic Literature Review and Bibliometric Study," *Profetika J. Stud. Islam*, vol. 26, no. 02, pp. 407–420, Aug. 2025, https://doi.org/10.23917/profetika.v26i02.11522.

[10] C. Rosanti, Waston, Gigih Setianto, Yogi Muhammad Saputro, Mahnoor Fatima, and Muhammad Rehan Sabi, "Global Trends and Controversies in Multicultural Islamic Education within the SDGs Framework," *Profetika J. Stud. Islam*, vol. 26, no. 03, pp. 977–990, Dec. 2025, https://doi.org/10.23917/profetika.v26i03.13502.

[11] U. Yudi, "Green Islam Education: Menanamkan Kesadaran Ekoteologis dalam Kurikulum Pendidikan Islam," *Model. J. Progr. Stud. PGMI*, vol. 12, no. 1, pp. 482–495, Mar. 2025,

Copyright © 2026 Authors

https://doi.org/10.69896/modeling.v12i1.2931.

[12] M. L. Mustofa, M. F. Zenrif, and A. Barizi, "Towards an Islamic Ecotheology: Indonesian Muslim Organisations in Climate Mitigation and Adaptation Efforts," *Probl. Ekorozwoju*, vol. 20, no. 2, pp. 21–31, Jul. 2025, https://doi.org/10.35784/preko.7089.

[13] J. Koehrsen, "Muslims and climate change: How Islam, Muslim organisations, and religious leaders influence climate change perceptions and mitigation activities," *Wiley Interdiscip. Rev. Clim. Chang.*, vol. 12, no. 3, May 2021, https://doi.org/10.1002/wcc.702.

[14] Ahmad Suryadi, Abdul Azis Masang, Muhammad Ulil Amri, Samikshya Madhukullya, and Emmanuel Ande Ivorgba, "Critical Review of KMA 1503/2025: The Transformation of the Madrasah Curriculum Based on Deep Learning and the Curriculum of Love," *Amorti J. Stud. Islam Interdiscip.*, pp. 36–41, Jan. 2026, https://doi.org/10.59944/amorti.v5i1.584.

[15] L. Nugraha, "Implementasi Kurikulum Berbasis Cinta pada Madrasah Ibtidaiyah di Kota Palembang: Sebuah Studi Literatur," *Linear J. Ilmu Pendidik.*, vol. 9, no. 2, pp. 89–102, Oct. 2025, https://doi.org/10.53090/j.linear.v9i2.1062.

[16] P. Prihantoro, H. J. Prayitno, I. Indri, and D. A. Kusumaningtyas, "Deep Learning: Policies, Concepts, and Implementation in Senior High Schools in Indonesia," *J. Deep Learn.*, pp. 11–24, Jun. 2025, https://doi.org/10.23917/jdl.v1i1.10964.

[17] E. Fauziati, "Deep Learning: A Theoretical Review," *Suar Betang*, vol. 20, no. 1, pp. 123–133, Jun. 2025, https://doi.org/10.26499/surbet.v20i1.30777.

[18] Eva Sunarya and Komarudin Sassi, "Curriculum Of Love: Efforts To Revitalise Humanism In Islamic Education," *IJGIE (International J. Grad. Islam. Educ.*, vol. 7, no. 1, pp. 11–26, Oct. 2025, https://doi.org/10.37567/ijgie.v7i1.4323.

[19] P. T. Nst and K. I. Al-Husna, "Implementasi kurikulum berbasis cinta pada pembelajaran akidah akhlak di Madrasah Aliyah Negeri 1 Mandailing Natal," *Al-Aulia J. Pendidik. dan Ilmu-Ilmu Keislam.*, vol. 11, no. 2, pp. 202–211, Dec. 2025, https://doi.org/10.46963/aulia.v11i2.3462.

[20] R. R. Apriana, M. U. U. A. Abshar, A. P. Yani, D. Sulistyowati, and U. Susilawati, "Strategi Guru Madrasah Tsanawiyah Negeri Salatiga Dalam Insersi Kurikulum Berbasis Cinta," *MANAJERIAL J. Inov. Manaj. dan Supervisi Pendidik.*, vol. 5, no. 4, pp. 922–930, Nov. 2025, https://doi.org/10.51878/manajerial.v5i4.7664.

[21] E. Şahin, Ö. F. Görçün, Ö. Görçün, C. Ş. Kölemen, and E. B. Tirkolaee, "An integrated TFN-MARCOS-SWOT model for multi-criteria evaluation of digital transformation and maturity in higher education institutions," *Expert Syst. Appl.*, vol. 311, p. 131455, 2026, https://doi.org/10.1016/j.eswa.2026.131455.

[22] J. Li, X. Yin, and J. Han, "Construction and instructional application experiment design of digital light processing 3D printing equipment," *Exp. Technol. Manag.*, vol. 42, no. 7, pp. 240–245, 2025, https://doi.org/10.16791/j.cnki.sjg.2025.07.031.

[23] W. Zheng, H. Li, R. Gu, and Y. Ji, "Research on the Practical Teaching Mode for Cultivating Autonomous Learning Abilities in Networking Courses," in *Proc. Front. Educ. Conf.*, FIE, Institute of Electrical and Electronics Engineers Inc., 2026, pp. 1–10. https://doi.org/10.1109/fie63693.2025.11328529.

[24] Z. Li, L. Chen, W. Sun, Y. Zhang, and G. Lin, "Multiscale spatial heterogeneity and interactions of digital economy development and urban-rural income inequality on energy-related carbon emissions in Chinese cities," *Energy*, vol. 342, p. 139739, 2026, https://doi.org/10.1016/j.energy.2025.139739.

[25] Y. Røe, T. S. Johansen, and E. B. Bruset, "From Peer Educators to Digital Change Agents: Rethinking Health Education Through VR-Enhanced Peer Learning," in *Lecture Notes in Computer Science*, vol. 15913 LNCS, S. F.E. and S. T.A., Eds., Springer Science and Business Media Deutschland GmbH, 2026, pp. 354–362. https://doi.org/10.1007/978-3-031-98185-2_37.

[26] P. S. Cox and T. N. Bowles, "Expanding the neighbourhood watch: Orthographic neighbours in isiXhosa reading and spelling," *Read. Writ. (South Africa)*, vol. 15, no. 1, 2024, https://doi.org/10.4102/rw.v15i1.461.

Copyright © 2026 Authors

[27] M. Lörz, B. Becker, J. Niemann, K. Drossel, and B. Eickelmann, "Social inequality in digital competencies among students in Germany: A trend analysis using ICILS data 2013-2023," *Comput. Educ.*, p. 105637, Apr. 2026, https://doi.org/10.1016/j.compedu.2026.105637.

[28] A. A. Mohamed, M. A. Rozaq, M. Ndow, and M. Rabe, "Adab as the Epistemological Foundation of Islamic Education: A Study of Syed Naquib al-Attas." 2025.

[29] A. Durand *et al.*, "'Who can I ask for help?': Mechanisms behind digital inequality in public transport," *Cities*, vol. 137, p. 104335, 2023, https://doi.org/10.1016/j.cities.2023.104335.

[30] P. Xiong and Y. Zhang, "Artificial intelligence as an assistive technology in language education: investigating TPACK, self-efficacy, and organisational support," *Disabil. Rehabil. Assist. Technol.*, 2025, https://doi.org/10.1080/17483107.2025.2561927.

[31] M. Zhou and X. Du, "Digital government and air pollution inequality: Evidence from Chinese cities," *Econ. Model.*, vol. 152, p. 107301, 2025, https://doi.org/10.1016/j.econmod.2025.107301.

[32] Y. Zhu, H. Guo, S. Liu, and S. Jin, "Design of adaptive electrician learning system based on user model," in *Proceedings - 2016 8th International Conference on Information Technology in Medicine and Education, ITME 2016*, D. Y., L. S., and C. Y., Eds., Educ., ITME: Institute of Electrical and Electronics Engineers Inc., 2017, pp. 513–516. https://doi.org/10.1109/ITME.2016.0122.

[33] Alwy Ahmed Mohamed, Muhammad Ndow, and Mowafg Masuwd, "Reconstructing Madrasa Education through Critical Pedagogy: A Freirean Framework for Islamic Educational Reform," *Lect. J. Islam. Educ. Stud.*, vol. 5, no. 1, pp. 97–114, Mar. 2026, https://doi.org/10.58355/lectures.v5i1.207.

[34] M. Sanches and M. D'Amico, "Adult educators' perspectives on implementing critical pedagogy in a Freirean tradition in non-formal settings," *Int. J. Lifelong Educ.*, 2026, https://doi.org/10.1080/02601370.2026.2624459.

[35] H. Jho, "Analysis of explanations of quantum mechanics in physics textbooks according to the 2015 revised curriculum," *New Phys. Sae Mulli*, vol. 68, no. 8, pp. 869–879, 2018, https://doi.org/10.3938/NPSM.68.869.

[36] E. Chen *et al.*, "Identifying Effective Praise in Tutoring: Large Language Models with Transparent Explanations," in *Lecture Notes in Computer Science*, vol. 15882, LNAI, W. E., L. Y., S. O.C., and I. S., Eds., Springer Science and Business Media Deutschland GmbH, 2025, pp. 157–163. https://doi.org/10.1007/978-3-031-98465-5_20.

[37] S. Dawadi, S. Shrestha, and R. A. Giri, "Mixed-Methods Research: A Discussion on its Types, Challenges, and Criticisms," *J. Pract. Stud. Educ.*, vol. 2, no. 2, pp. 25–36, Feb. 2021, https://doi.org/10.46809/jpse.v2i2.20.

[38] H. Huang, Y. Liu, and D. Wang, "Bridging or widening: How digital infrastructure shapes wage inequality through the lens of urban–rural interdependence," *Econ. Model.*, vol. 160, p. 107625, 2026, https://doi.org/10.1016/j.econmod.2026.107625.

[39] Alwy Ahmed Mohamed, Zaki Afifi, and M. Mahmudulhassan, "Critical Pedagogy in Islamic History Education: Applying Henry Giroux's Framework," *Bull. Islam. Res.*, vol. 3, no. 3, pp. 541–554, 2025, https://doi.org/10.69526/bir.v3i3.363.

[40] Meti Fatimah, Edy Muslimin, Aminatus Sayidah, and Alwy Ahmed Mohamed, "Technological Mastery and Competence Development of Islamic Religious Education Teachers in Wonogiri: Supporting SDG 4 on Quality Education," *Profetika J. Stud. Islam*, vol. 26, no. 01, pp. 245–258, 2025, https://doi.org/10.23917/profetika.v26i01.11744.

[41] I. K. S. Ng, W. G. W. Goh, D. B. Teo, K. M. Chong, L. F. Tan, and C. M. Teoh, "Clinical reasoning in real-world practice: a primer for medical trainees and practitioners," *Postgrad. Med. J.*, vol. 101, no. 1191, pp. 68–75, 2024, https://doi.org/10.1093/postmj/qgae079.

[42] H. Retnawati, "Proving content validity of self-regulated learning scale (The comparison of Aiken index and expanded Gregory index)," *REID (Research Eval. Educ.*, vol. 2, no. 2, pp. 155–164, Dec. 2016, https://doi.org/10.21831/reid.v2i2.11029.

Copyright © 2026 Authors

[43] H. Hochrinner, "New role model for teachers in Higher Education?," in *Balkan Region Conference on Engineering and Business Education*, vol. 2019-Octob, L. L., K. C.V., G. N., and S. Eds., 2019, pp. 62–67. https://doi.org/10.2478/cplbu-2020-0007.

[44] Nahrul Faidin, Tri Marhaeni Pudji Astuti, Sucihatiningsih Dian Wisika Prajanti, Puji Hardati, and Alwy Ahmed Mohamed, "Shaping Children's Social Ethics in Female Migrant Families: Islamic Insights on Education and Gender within the SDGs Framework," *Profetika J. Stud. Islam*, vol. 26, no. 01, pp. 321–338, 2025, https://doi.org/10.23917/profetika.v26i01.11124.

[45] S. Syahrizal, F. Yasmi, and T. Mary, "AI-Enhanced Teaching Materials for Education: A Shift Towards Digitalisation," *Int. J. Relig.*, vol. 5, no. 1, pp. 203–217, Jan. 2024, https://doi.org/10.61707/j6sa1w36.

[46] K. Hayati, A. U. T. Pada, and M. Mawarpury, "Content Validity of Collective Efficacy Questionnaire for Natural Disasters Based on Aceh Local Wisdom," *E3S Web Conf.*, vol. 447, p. 04004, Nov. 2023, https://doi.org/10.1051/e3sconf/202344704004.

[47] J. M. Nissen, R. M. Talbot, A. Nasim Thompson, and B. Van Dusen, "Comparison of normalised gain and Cohen's d for analysing gains on concept inventories," *Phys. Rev. Phys. Educ. Res.*, vol. 14, no. 1, p. 010115, Mar. 2018, https://doi.org/10.1103/PhysRevPhysEducRes.14.010115.

[48] S. I. Shakeel, M. A. Al Mamun, and M. F. A. Haolader, "Instructional design with ADDIE and rapid prototyping for blended learning: validation and its acceptance in the context of TVET Bangladesh," *Educ. Inf. Technol.*, vol. 28, no. 6, pp. 7601–7630, Jun. 2023, https://doi.org/10.1007/s10639-022-11471-0.

[49] S. S. Deshpande *et al.*, "Curriculum and Community with Research, Action and Service (CCBALwRAS), a Pedagogical Shift for Social Change," *High. Educ. Futur.*, vol. 11, no. 1, pp. 11–31, 2024, https://doi.org/10.1177/23476311231210636.

[50] J. Biggs, C. W. Harris, and J. Rudolph, "Teaching for Quality Learning at Changing Universities. A tour de force of modern education history – an interview with Professor John Biggs," *J. Appl. Learn. Teach.*, vol. 2, no. 1, pp. 54–62, Apr. 2019, https://doi.org/10.37074/jalt.2019.2.1.6.

[51] C. M. Thurn, P. A. Edelsbrunner, M. Berkowitz, A. Deiglmayr, and L. Schalk, "Questioning central assumptions of the ICAP framework," *npj Sci. Learn.*, vol. 8, no. 1, p. 49, Nov. 2023, https://doi.org/10.1038/s41539-023-00197-4.

[52] L. Fries, J. Y. Son, K. B. Givvin, and J. W. Stigler, "Practising Connections: A Framework to Guide Instructional Design for Developing Understanding in Complex Domains," *Educ. Psychol. Rev.*, vol. 33, no. 2, pp. 739–762, Jun. 2021, https://doi.org/10.1007/s10648-020-09561-x.

[53] D. J. Shernof, E. A. Ruzek, A. J. Sannella, R. Y. Schorr, L. Sanchez-Wall, and D. M. Bressler, "Student engagement as a general factor of classroom experience: Associations with student practices and educational outcomes in a university gateway course," *Front. Psychol.*, vol. 8, no. JUN, Jun. 2017, https://doi.org/10.3389/fpsyg.2017.00994.

[54] M. Mawardi, "Designing the Implementation of Model and Instructional Media," *Sch. J. Pendidik. dan Kebud.*, vol. 8, no. 1, pp. 26–40, Jan. 2018, https://doi.org/10.24246/j.js.2018.v8.i1.p26-40.

[55] S. Brookfield, "Transformative Learning and the Awareness of White Supremacy," *Phronesis*, vol. 7, no. 3, pp. 63–69, Dec. 2018, https://doi.org/10.7202/1054410ar.

[56] Mukhsin Mukhsin and Ilzam Hubby Dzikrillah Alfani, "Integrating Islamic Eco-Theology into Religious Education: A New Paradigm for Curriculum Development," *Indones. J. Islam. Relig. Educ.*, vol. 3, no. 2, pp. 183–196, Dec. 2025, https://doi.org/10.63243/mpr1js26.

E-ISSN: 2988-3512
Copyright © 2026 Authors