

## PAPERLESS ARABIC LANGUAGE LEARNING: INTEGRATING ECOTHEOLOGY, BILINGUAL EDUCATION, AND THE LOVE-BASED CURRICULUM IN MADRASAH

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### Abstract

**Background:** Deforestation and rising carbon emissions resulting from excessive paper use in education have encouraged the development of sustainable, technology-based, and environmentally friendly learning models. **Research Objectives:** This study aims to describe the implementation of paperless bilingual learning in Arabic at MTs Quranic Scientia, UIN Imam Bonjol Padang, analyze its alignment with eco-theological principles; examine the role of the Love-Based Curriculum (KBC); and identify its opportunities and challenges in supporting Arabic learning. **Methodology:** This study employed a qualitative approach with an intrinsic case study design. Data were collected through in-depth interviews, participant observation, and document analysis involving teachers, students, and school administrators. To ensure validity, the study applied triangulation and member checking, while data were analyzed iteratively through data reduction, display, and conclusion drawing. **Results:** The findings reveal that paperless bilingual Arabic learning supported by iPads, smartboards, and the Cerdig e-learning platform enhances students' Arabic proficiency, digital literacy, and classroom engagement. The integration of the Love-Based Curriculum fosters collaborative, caring, and confidence-building learning interaction, while ecotheological values strengthen students' environmental awareness and responsibility. Despite challenges related to language proficiency, technical issues, and students' self-confidence, the model demonstrates significant potential in promoting sustainable, technology-based Islamic education. **Unique Contribution:** The integration of the Love-Based Curriculum strengthens values of environmental responsibility, compassion, and respect within the learning process, offering an integrative model combining paperless learning, bilingual education, and eco-theological in Islamic education. **Conclusion:** This study concludes that the approach improves students' Arabic proficiency, academic performance, and digital skills while fostering ecological awareness. **Recommendations:** This model is recommended for adaptation in other madrasahs with contextual adjustments.

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**Keywords:**

Paperless Education; Bilingual Education; Eco-Theology; Love-Based Curriculum; Islamic Education; Educational Digital Transformation; Environmental ethics.

## Introduction

The global pulp and paper industry accounts for approximately 13–15% of the world's industrial wood consumption, producing around 405 million tons of paper and board annually.<sup>1</sup> This extensive production is a major driver of deforestation, land degradation, and carbon emissions, especially when raw materials come from unsustainable forestry practices.<sup>2</sup> Consequently, the paper consumption is directly linked to the global climate crisis and the growing threat of climate change.<sup>3</sup>

At MTs Qur'anic Scientia UIN Imam Padang, paper remains heavily in both academic and administrative activities. Every semester, hundreds of reams of paper are consumed for exams, reports, and teaching materials. While this amount may seem reasonable at the scale of a single school, when multiplied across hundreds of schools and madrasahs in Padang City, the volume of paper use becomes a serious issue, leaving a significant ecological footprint.<sup>4</sup>

At the regional level, data from the Padang City Environmental Agency in 2022 recorded that 12–15% of the total 650 tons of daily waste consisted of paper waste, most of which came from offices and educational institutions.<sup>5</sup> Meanwhile, in West Sumatra, paper waste was recorded at 200 tons per day out of a total of 2,000 tons of daily waste generated. These figures indicate that paper-based administrative and educational practices have a tangible contribution to environmental pressure. More importantly, they indicate that educational institutions have become one of the sectors contributing to local and regional ecological challenges.

This phenomenon does not occur in isolation, as the paper industry on a global scale is one of the significant contributors to carbon emissions. A WWF report states that this sector consumes 14% of the world's industrial wood and contributes approximately 2% of global carbon emissions.<sup>6</sup> In other words, paper usage in schools and madrasahs in Indonesia is not merely an ordinary administrative

<sup>1</sup> Dylan D. Furszyfer Del Rio et al., "Decarbonizing the Pulp and Paper Industry: A Critical and Systematic Review of Sociotechnical Developments and Policy Options," *Renewable and Sustainable Energy Reviews* 167 (October 2022): 112706, <https://doi.org/10.1016/j.rser.2022.112706>; Hilton Maverengo et al., "Pulp And Paper Industry: A Review," *Tuijin Jishu/Journal of Propulsion Technology* 44, no. 5 (2023), <https://www.propulsiontechjournal.com/index.php/journal/article/view/3356>.

<sup>2</sup> Patrik Söderholm et al., "Environmental Regulation in the Pulp and Paper Industry: Impacts and Challenges," *Current Forestry Reports* 5, no. 4 (2019): 185–98, <https://doi.org/10.1007/s40725-019-00097-0>; Mingxing Sun et al., "Uncovering Energy Use, Carbon Emissions and Environmental Burdens of Pulp and Paper Industry: A Systematic Review and Meta-Analysis," *Renewable and Sustainable Energy Reviews* 92 (September 2018): 823–33, <https://doi.org/10.1016/j.rser.2018.04.036>.

<sup>3</sup> Yoselin Oropeza Abregú and Hassan Aftab Sheikh, "A Dual-Workflow Framework for Evaluating Pulp and Paper Industry Impacts on Nature," *Environmental Impact Assessment Review* 118 (April 2026): 108307, <https://doi.org/10.1016/j.eiar.2025.108307>.

<sup>4</sup> Fotis Lazarinis, "Descriptive Cataloguing Codes and the Anatomy of AACR2," in *Cataloguing and Classification* (Elsevier, 2015), <https://doi.org/10.1016/B978-0-08-100161-5.00002-6>.

<sup>5</sup> Defri Rahman et al., "Analysis of Government Policies in Padang City in Food Waste Management at the Household Level," *Jurnal Riset Multidisiplin Dan Inovasi Teknologi* 2, no. 01 (2023): 26–36, <https://doi.org/10.59653/jimat.v2i01.307>.

<sup>6</sup> Stijn Van Ewijk et al., "Limited Climate Benefits of Global Recycling of Pulp and Paper," *Nature Sustainability* 4, no. 2 (2020): 180–87, <https://doi.org/10.1038/s41893-020-00624-z>.

practice but is part of a global ecological chain that accelerates deforestation and the climate crisis.

The idea of transitioning to a paperless environment has started to be adopted in several secondary schools in Indonesia, including Bekasi, through the use of e-learning and digital devices.<sup>7</sup> This approach reflects a systematic effort to reduce reliance on paper while fostering ecological awareness within the educational environment.

Studies show that students' readiness to adopt paperless learning is affected by their environmental awareness, digital literacy, and usage habits. Together, these three factors explain a significant portion of the variability in their readiness.<sup>8</sup> These findings emphasize that digital transformation in educational institutions is not merely a technological issue but is also closely related to learning culture and the internalization of ecological values among students.

In contemporary Islamic education discourse, increasing attention is being given to the relationship between spiritual values and ecological responsibility. This perspective arises from the principle that humans serve as Allah's stewards (khalifah) on Earth with the mandate to maintain ecological balance (Q.S. al-Baqarah: 30; al-A'rāf: 56). This framework is known as ecotheology, which, according to Syafaruddin, can be operationalized through curriculum design, teaching methods, and madrasah culture to produce learners who are not only religiously pious but also ecologically conscious.<sup>9</sup> Such ecological awareness is closely linked to how students access and process knowledge, which leads us to the discourse on bilingual education.

In the field of education, the use of two or more languages is increasingly recognized as essential for strengthening students' global competencies. This practice enables learners to access knowledge from diverse local and international sources. Research by Bialystok et al. demonstrates that bilingualism positively influences cognitive flexibility and executive control, while other studies highlight that bilingual education expands opportunities for global literacy and intercultural competence.<sup>10</sup> Thus, the implementation of Arabic and English in madrasahs, alongside Indonesian, presents strategic opportunities to broaden academic horizons and strengthen digital-based learning. However, these cognitive and global

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<sup>7</sup> Dwi Ratnasari et al., "The Integration of Eco-Theology in Sekolah Alam Yogyakarta: A Living Quran: Integrasi Eco-Theology Di Sekolah Alam Yogyakarta: Sebuah Living Quran," *EduLab : Majalah Ilmiah Laboratorium Pendidikan* 9, no. 2 (2025): 283–96, <https://doi.org/10.14421/edulab.2024.92.08>.

<sup>8</sup> Anne-Mette Nortvig et al., "Digital Expansions of Physical Learning Spaces in Practice-Based Subjects - Blended Learning in Art and Craft & Design in Teacher Education," *Computers & Education* 159 (December 2020): 104020, <https://doi.org/10.1016/j.compedu.2020.104020>.

<sup>9</sup> Baso Syafaruddin, "Ecotheology in the Perspective of Islamic Education: A Conceptual Review," *ETDC: Indonesian Journal of Research and Educational Review* 4, no. 3 (2025): 720–31, <https://doi.org/10.51574/ijrer.v4i3.3253>.

<sup>10</sup> Ellen Bialystok et al., "Bilingual Minds," *Psychological Science in the Public Interest* 10, no. 3 (2009): 89–129, <https://doi.org/10.1177/1529100610387084>; Ofelia García and Li Wei, "Language, Bilingualism and Education," in *Translanguaging*, by Ofelia García and Li Wei (Palgrave Macmillan UK, 2014), [https://doi.org/10.1057/9781137385765\\_4](https://doi.org/10.1057/9781137385765_4).



dimensions will only be fully meaningful if integrated with a robust affective foundation, specifically through a Love-Based Curriculum.

The idea of a curriculum emphasizing compassion, care, and love is increasingly gaining recognition within humanistic education discourse. Underwood highlights that the ethics of care serve as a crucial foundation for shaping students' character.<sup>11</sup> From this perspective, the Love-Based Curriculum (Kurikulum Berbasis Cinta, KBC) becomes an instrument capable of fostering social empathy and environmental sensitivity. By internalizing values of love that extend beyond interpersonal relationships to encompass care for nature, KBC can be positioned as a strategic medium to integrate the ecotheology dimension into madrasah education. Thus, ecotheology, bilingual education, and KBC are interlinked as three essential pillars that can create a framework for sustainable Islamic education.

According to research by Sapitri et al., the Islamic Religious and Character Education Curriculum (IRCE) has not yet significantly incorporated the cognitive aspect of ecotheological principles, but it nevertheless places a strong emphasis on the emotive aspect of environmental education. This result suggests that instead of systematic knowledge growth, environmental awareness in Islamic education frequently remains at the level of moral encouragement. Therefore, it is thought to be crucial to incorporate ecotheological viewpoints into Islamic education in order to improve students' critical awareness of environmental responsibility based on Islamic teachings as well as to strengthen the internalization of Islamic principles. In this way, Islamic education can catalyze the development of spiritually grounded, ecologically conscious behavior.<sup>12</sup>

Taufikin asserts that the ecotheology paradigm in Islamic education necessitates a comprehensive framework that links instructional methods, curriculum design, and philosophical underpinnings. When these elements are successfully combined, education can progress from theoretical debates to transformative methods that mold students into ecologically conscious and spiritually devoted individuals. However, rather than incorporating these ideas into creative learning models backed by digital technology, the majority of ecotheological education implementations still concentrate on value transmission.<sup>13</sup>

Several studies on environmentally conscious madrasahs indicate that programs such as waste management, school greening initiatives, and education focused on green values significantly enhance students' ecological awareness.<sup>14</sup>

<sup>11</sup> Julie Underwood, "Legal Talk: The Supreme Court and Schools," *Educational Horizons* 90, no. 1 (2011), <https://www.jstor.org/stable/42926574>.

<sup>12</sup> Elfira Yunita Sapitri et al., "Integrating Ecotheology into Islamic Religious Education: A Systematic Literature Review on Students' Spiritual, Social, and Cognitive Character Development," *DAYAH: Journal of Islamic Education* 8, no. 2 (2025): 178–201, <https://doi.org/10.22373/jie.v8i2.34136>.

<sup>13</sup> Taufikin Taufikin, "Integrating Eco-Theology In Islamic Education: A Case Study On Fostering Ecological Awareness Through Religious Pedagogy," *El-Tarbawi* 18, no. 1 (2025): 1–37, <https://doi.org/10.20885/tarbawi.vol18.iss1.art1>.

<sup>14</sup> Nini Maulani and Rizqiyah Ratu Balqis, "Zero Waste-Oriented Adiwiyata Program in Developing Environmental Care Character of Madrasah Ibtidaiyah Students," *IJCER (International Journal of Chemistry Education Research)*, April 30, 2026, 35–42, <https://doi.org/10.20885/ijcer.vol10.iss1.art4>.

Although these initiatives effectively foster environmental attitudes and social responsibility, they typically concentrate on extracurricular or school culture activities rather than being methodically integrated into classroom learning processes, especially in language learning contexts like Arabic bilingual education.

Additionally, bilingual education as a strategy to improve students' language proficiency and paperless learning as a component of the digital transformation in education have been extensively covered in prior studies. However, these studies typically look at these factors independently. While bilingual education research primarily concentrates on language competence outcomes without directly connecting them to ecological or ethical principles, paperless learning is frequently examined in terms of technical efficiency and environmental sustainability.<sup>15</sup>

As a result, the literature on the incorporation of multilingual education, paperless learning, and ecotheological viewpoints into the madrasah educational system is still severely lacking. Addressing this gap, this study suggests an integrated learning paradigm that blends eco-friendly digital learning techniques with multilingual Arabic instruction based on ecotheological principles and the Love-Based Curriculum. By linking these three aspects, this study helps create a novel paradigm for Islamic education that concurrently addresses environmental sustainability, digital change, and the improvement of Arabic language instruction in madrasahs.

Studies on madrasahs integrating environmental culture report that programs such as waste management, greening initiatives, and environmentally friendly character-building activities significantly influence students' ecological awareness.<sup>16</sup> These initiatives have proven effective in supporting the development of socially and ecologically responsible character. Thus, Islamic-based schools have great potential to become pioneers in fostering a culture of sustainable education.

Although many studies address individual aspects such as paperless learning, bilingual education, or ecotheology, only limited number explore the integration of all three within the madrasah education system in Indonesia. This gap opens a space for academic innovation to formulate an Islamic education model that is responsive to both digital and ecological challenges.

This article explores MTs Quranic Scientia as a unique case study that integrates bilingual paperless learning within the framework of a Love-Based Curriculum (Kurikulum Berbasis Cinta) grounded in ecotheology. In this context, the findings offer both theoretical and practical contributions: an education model that promotes academic achievement, technological literacy, and ecological awareness. Accordingly, this study aims to offer a roadmap for replicating similar models in other madrasahs with appropriate local adaptations.

<sup>15</sup> Angela Gersalia and Michael Estremera, "A Systematic Literature Review of Bilingual Education Models: Approaches and Educational Outcomes," *International Journal of Language Teaching and Education* 9, no. 2 (2025): 1–12, <https://doi.org/10.22437/ijolte.v9i2.44428>; M. Khafid et al., "Environmental Sustainability: Insight into Paperless Policy and Integrated Audit Internal System," *IOP Conference Series: Earth and Environmental Science* 1248, no. 1 (2023): 012008, <https://doi.org/10.1088/1755-1315/1248/1/012008>.

<sup>16</sup> Mansur Hidayat, "Islamic Eco-Theology: Religious Narratives in the Climate Crisis in Indonesia," *Bulletin of Indonesian Islamic Studies* 2, no. 2 (2023): 197–212, <https://doi.org/10.51214/biis.v2i2.678>.

## Method

This study employs a qualitative approach with an intrinsic case study design.<sup>17</sup> Capturing the unique character of MTs Quranic Scientia, which integrates technology and spiritual values, this approach allows for an in-depth analysis of the interaction between paperless learning, bilingual education, and ecotheology within the madrasah context. The focus is not on generalization but on understanding a local, multi-dimensional phenomenon. Thus, this approach aligns with the holistic and transformative paradigm of Islamic education.

Following this approach, the case was selected purposively to ensure relevance to the main focus. MTs Quranic Scientia was chosen as the research locus because it pioneered the implementation of iPads in every classroom and integrated the Love-Based Curriculum (Kurikulum Berbasis Cinta) into daily practice.<sup>18</sup> The case study was restricted to the past year to ensure that the implementation dynamics of implementation were evident and contextual. Research subjects included the head of the madrasah, bilingual teachers, curriculum developers, and students to provide a wide coverage of perspectives.<sup>19</sup> This approach facilitates the observation of sustainable practices and minimizes potential biases that may occur from partial study, in line with the methodological principles of intrinsic case studies.<sup>20</sup>

Furthermore, the data collection methods were designed to accommodate the complexity of the phenomenon. Data were gathered through in-depth interviews, participatory observation, and analysis of digital documents.<sup>21</sup> Interviews targeted key participants to explore their understanding of paperless and bilingual learning practices.

Classroom observations were conducted to capture the dynamics of digital device usage and bilingual interactions. In addition, digital documents from e-learning platforms and curriculum notes were analyzed to strengthen data validity.<sup>22</sup>

To ensure the reliability of the collected data, this study employed source triangulation (interviews, observations, digital documentation) and member checking. Cross-checking was conducted to reduce subjective bias from a single

<sup>17</sup> John W. Creswell and Cheryl N. Poth, *Qualitative Inquiry and Research Design: Choosing Among Five Approaches* (SAGE Publications, 2016).

<sup>18</sup> Auliak Bahtiar et al., "Integrating Eco-Sufi Values into Environmental Education through the Adiwiyata Madrasah Program," *Journal of Islamic Education Research* 6, no. 3 (2025): 261–74, <https://doi.org/10.35719/jier.v6i3.486>.

<sup>19</sup> Putri Nirmalasari et al., "Bilingual Education in Rural Islamic High Schools: Teachers' and Students' Perspectives and Experiences," *Tamaddun* 22, no. 1 (2023): 11–19, <https://doi.org/10.33096/tamaddun.v22i1.268>.

<sup>20</sup> Juliani et al., "Green Islamic School: Integrating Environmental Education in the Islamic Education Curriculum," *Cendekiawan: Jurnal Pendidikan Dan Studi Keislaman* 3, no. 3 (2024): 565–74, <https://doi.org/10.61253/cendekiawan.v3i3.270>.

<sup>21</sup> Sugito Sugito, "Hybrid Learning in Pesantren: Integrating Digital Pedagogy and Islamic Values to Enhance 21st-Century Competencies," *Tafkir: Interdisciplinary Journal of Islamic Education* 5, no. 4 (2024): 749–64, <https://doi.org/10.31538/tijie.v5i4.2207>.

<sup>22</sup> Nick Surawy-Stepney et al., "Introduction to Qualitative Research Methods: Part 2," *Perspectives in Clinical Research* 14, no. 2 (2023): 95–99, [https://doi.org/10.4103/picr.picr\\_37\\_23](https://doi.org/10.4103/picr.picr_37_23).

source. Member checking involved presenting preliminary findings to key informants to allow them to offer corrections. This validation mechanism maintained research integrity and enhanced the participants' trust in the research process. This approach aligns with contemporary qualitative research standards.

The data analysis process began once validity was confirmed. Analysis followed an interactive model consisting of three stages: data reduction, data display, and conclusion drawing/verification.<sup>23</sup> In the reduction stage, data were categorized thematically according to the research focus. Next, the data were displayed in matrices, diagrams, or visual narratives to clarify emerging patterns. Verification was conducted through triangulation and member checking to ensure that the analysis results were valid and logically accountable.<sup>24</sup>

In addition to analytical techniques, research ethics were a primary concern. The researcher obtained official permission from the madrasah and provided informed consent to the participants.<sup>25</sup> All data in the study report were anonymised, and participant identities were kept private. During observations and interviews, the researcher employed a participatory-reflective approach, actively participating in the field but keeping an analytical distance. Given the study atmosphere, which included both religious and educational principles, this strategy was especially crucial.

## Result and Discussion

### The implementation of paperless Arabic learning at MTs Quranic Scientia

At MTs Quranic Scientia, the first steps in implementing paperless learning include providing each student an iPad and setting up a smartboard in each classroom. Digital learning resources, such as interactive modules, instructional videos, and app-based tasks, are created by teachers. The Cerdig e-learning platform and other auxiliary apps provide students with access to all instructional materials. This method promotes digital literacy from a young age while virtually completely doing away with the need for paper.

The paperless system facilitates a variety of digital learning exercises intended to improve students' linguistic proficiency in the context of learning Arabic. Arabic instructors use digital modules that are accessible via the e-learning platform and include vocabulary exercises (mufradāt), reading texts (qirā'ah), and interactive tests. While speaking exercises (kalām) are developed through class discussions and digital presentation challenges using the smartboard, students are also encouraged to practice listening (istimā') through Arabic audio and video materials. In contrast

<sup>23</sup> Cecep Wahyu Hoerudin, "Optimizing Bilingual Teaching in Developing Students' English Language Skills," *International Journal of Science and Society* 6, no. 3 (2024): 336–47, <https://doi.org/10.54783/ijssoc.v6i3.1248>.

<sup>24</sup> Muhammad Thohri, "Development of Environmentally Conscious Islamic Religious Education Curriculum at Elementary, Secondary, and Tertiary Education Levels," *Journal of Advances in Education and Philosophy* 8, no. 02 (2024): 76–87, <https://doi.org/10.36348/jaep.2024.v08i02.005>.

<sup>25</sup> British Educational Research Association [BERA], *Ethical Guidelines for Educational Research*, fourth edition (London, 2018), <https://www.bera.ac.uk/researchers-resources/publications/ethical-guidelines-for-educational-research-2018>.

to traditional printed textbooks, these digital resources give students a more flexible and dynamic approach to connect with Arabic learning materials.

Additionally, the paperless environment boosts students' enthusiasm and engagement in Arabic learning activities by allowing teachers to give immediate feedback through online tests and gamified learning programs. By using this method, paperless learning not only cuts down on paper usage but also fosters a more dynamic learning environment that helps students improve both their digital literacy and Arabic language proficiency. The paperwork pertaining to MTs Quranic Scientia's adoption of paperless learning is listed below.



**Figure 1.** Interface of the Cerdig E-Learning Platform at MTs Quranic Scientia

In line with the madrasah's vision, this digital-based learning is similarly implemented using a bilingual approach (Indonesian–Arabic/English). Teachers employ a flipped classroom model, where students are directed to study the material at home via iPads before the in-class session. During face-to-face meetings, activities focus on discussions, Q&A, and problem-solving. The integration of cooperative learning ensures that students are actively engaged in the learning process.<sup>26</sup>

Evaluation is carried out through digital quizzes, e-portfolio assignments, and exams directly connected to the Cerdig system. This allows teachers to conduct real-time assessments while students receive faster feedback. Observations indicate that this model not only optimizes time and resources but also hones students' digital skills and reinforces ecotheology values, which are central to the madrasah's character.<sup>27</sup> The learning stages can be summarized in the following table:

<sup>26</sup> Machfud Bachtihar et al., "Innovations in Islamic Religious Education in Bilingual Madrasah Aliyah: A Systematic Literature Review," *AL-ISHLAH: Jurnal Pendidikan* 17, no. 2 (2025): 2115–24, <https://doi.org/10.35445/alishlah.v17i2.5453>.

<sup>27</sup> Muhammad Ichsan Rifqi and Aria Saputra, "Love-Based Curriculum: Fostering Islamic Eco-Theology Education in Madrasah: Fostering Islamic Eco-Theology Education in Madrasah," *Ta'dibuna: Jurnal Pendidikan Islam* 14, no. 5 (2025): 536–53, <https://doi.org/10.32832/tadibuna.v14i5.21104>.

**Table 1.** Implementation Scheme of Bilingual Paperless Learning at MTs Quranic Scientia

Stage	Teacher Activities	Student Activities	Media/Platform
Preparation	Prepare digital modules and upload them to Cerdig	Download and read materials before class	iPad, Cerdig, Smartboard
Learning Process	Facilitate bilingual discussions, Think-Pair-Share, and problem-based learning	Participate in group discussions, give presentations, and collaborate	iPad, Smartboard, Cerdig
Evaluation	Create digital quizzes and assignments	Complete quizzes and upload assignments on Cerdig	Cerdig, Quizizz, Gamification

Based on Table 1, it is evident that the majority of the students are reasonably prepared to engage in bilingual learning, both in terms of vocabulary comprehension and their confidence to use the target language. However, this readiness is not yet optimal, as some students remain passive and hesitant when asked to express their ideas. Through the Love-Based Curriculum (KBC) approach, this readiness can be enhanced, since the model emphasizes collaboration and knowledge contribution.<sup>28</sup> Students actively participate in constructing knowledge instead of just receiving information passively. Consequently, weaknesses such as hesitation and passivity among some students can be reduced through more equitable interaction within the learning community.

The detailed execution scheme in Table 1 explicitly outlines the synergy between the three core pillars: paperless learning, bilingual education, and active learning methodology. In the Preparation phase, the use of iPads, Cerdig, and the Smartboard not only affirms the commitment to ecotheology by reducing paper consumption but also ensures uniform access to bilingual materials before class. Furthermore, in the Learning Process phase, the teacher's role as a facilitator guiding bilingual discussions with methods like Think-Pair-Share (TPS) directly encourages interaction and communication in the target language. This group collaboration (similar to the KBC approach) is a crucial foundation for nurturing the Love-Based Curriculum, as it instills the values of care, cooperation, and respect for others' ideas, thereby mitigating the hesitation and passivity observed among some students.

The integration of Cerdig, Quizizz, and Gamification in the Evaluation phase reinforces this approach. With digital and real-time assessments, the evaluation process becomes more efficient, while simultaneously reducing the potential for cheating and increasing individual accountability, which is an aspect of ecological and social responsibility. Moreover, the speed of feedback provided by the digital system allows teachers to promptly identify student needs and adjust their teaching strategies, aligning with the principles of love and care within the curriculum. Therefore, this scheme is not merely a sequence of activities, but a holistic

<sup>28</sup> Alfian Eko Rochmawan et al., "Socialization of the Love-Based Curriculum in the Teachers Working Group and the Principals Working Group of Islamic Elementary Schools in Plupuh Sub-District," *Jurnal Al Basirah* 5, no. 2 (2025), <https://ejournal.staimaswonogiri.ac.id/index.php/albasirah/article/view/450>.



framework that simultaneously promotes digital competency, language proficiency, and the internalization of ecotheology character values through collaborative and non-consumptive learning practices.

### Students Responses and Experiences

The implementation of bilingual-based paperless learning at MTs Quranic Scientia received positive responses from students. They observed that the use of iPads and smartboards supports their multilingual skills, particularly in Arabic and English, as all learning materials are available in bilingual digital formats. Students can easily switch between Indonesian and foreign languages, both when reading modules and completing exercises. This is in agreement with Fitriyah et al., who found that this approach makes the learning process more engaging while continuously enriching their vocabulary.<sup>29</sup>

Furthermore, students reported that the bilingual model helps build their confidence in communication. Classroom discussions, presentations, and peer teaching conducted through digital devices require them to use Arabic or English according to the context. Some students even mentioned feeling more “courageous” to speak thanks to integrated translation features or digital glossaries in the learning applications. This corresponds with Khomisah et al., who found that paperless learning not only reduces paper usage but also strengthens cross-linguistic communication skills, which have become part of the school’s identity.<sup>30</sup>

However, challenges remain. Some students still struggle with bilingual learning due to varying levels of foreign language proficiency. Additionally, potential distractions from iPads can reduce focus when practicing vocabulary or reading longer texts. Nevertheless, the majority of students still considered digital bilingual learning more practical, relevant, and aligned with the school’s vision of cultivating a Qur’anic generation proficient in global languages, as Hidayat et al. mentioned in their study.<sup>31</sup> The following data presents students’ learning experiences.

**Table 2.** Student Responses to Bilingual Paperless Learning

Aspect	Majority of Students’ Response
Vocabulary Mastery	Develops faster due to access to bilingual modules
Speaking Confidence	More confident in presenting in Arabic/English
Collaboration	Bilingual discussions more active with the help of iPads
Technological Support	Digital features help in understanding foreign terms
Challenges	Differences in language proficiency & distractions from iPad use

<sup>29</sup> Nailiyatul Fitriyah et al., “Teaching English in Pesantren: The Dynamics of Code-Switching in Multilingual Classrooms,” *Tamaddun* 24, no. 1 (2025), <https://jurnal.fs.umi.ac.id/index.php/tamaddun-life/article/view/844>.

<sup>30</sup> Soimatul Khomisah et al., “Environmentally Conscious Islamic Education Curriculum Design (Eco-Theology),” *Proceeding of International Conference of Islamic Education 3* (September 2025), <https://jurnal.iimsurakarta.ac.id/index.php/icie/article/view/817>.

<sup>31</sup> Wahidin Nur Hidayat et al., “E-Learning Based Teaching Revolution of the Quran Interpretation at Universitas Muhammadiyah Surakarta,” in *Proceedings of the International Conference on Islamic and Muhammadiyah Studies (ICIMS 2023)*, vol. 773, Advances in Social Science, Education and Humanities Research (Atlantis Press SARL, 2024), [https://doi.org/10.2991/978-2-38476-102-9\\_17](https://doi.org/10.2991/978-2-38476-102-9_17).

Students' reactions to using bilingual education were usually favorable, according to the findings of observations and interviews. They believed that employing two target languages, English and Arabic, as well as Indonesian as a supporting language accelerated their comprehension of the subject matter. This method allows students to progressively expand their vocabulary (*mufradāt*) and understanding of Arabic expressions while continuing to rely on Indonesian for clarification when needed in the context of learning Arabic. Nonetheless, several pupils continued to rely significantly on Indonesian, especially in the beginning.

The Love-Based Curriculum (KBC) is crucial in this situation. Students are encouraged to provide arguments, ask questions, and explain concepts in the target languages especially Arabic through discussion-based knowledge communities. As a result, students are using Arabic more frequently in relevant communicative contexts, which helps them improve their speaking (*kalām*) and reading (*qirā'ah*) abilities. This method enhances habitual bilingual communication by creating a natural setting.

The qualitative information from Table 2 supports the conclusion that this implementation emphasizes the growth of students' character and linguistic proficiency in addition to academic results. Digital devices are effective learning tools that aid in the acquisition of Arabic, as seen by the quicker development of vocabulary mastery and the assistance of digital features in comprehending foreign phrases.

Students can practice Arabic reading and word recognition more regularly by using digital dictionaries, interactive vocabulary activities, and multilingual digital texts accessed through iPads. Using these resources, students can independently review Arabic materials, improving their knowledge and retention of the language. This is in line with the Love-Based Curriculum's tenets, which state that education should empower students and lessen emotions of marginalization or dissatisfaction so that no kid is left behind because of a language barrier.<sup>32</sup>

Additionally, positive feedback on bilingual cooperation demonstrate that iPad usage promotes more equal student engagement. Students frequently help one another comprehend Arabic vocabulary and sentence structures during group projects, resulting in possibilities for peer-supported language acquisition. Students eventually gain confidence in speaking Arabic during class discussions thanks to this kind of interaction. As a result, the classroom dynamic changes into a supportive learning community that fosters character development and language proficiency, in line with the core ideas of the Love-Based Curriculum.

The overall replies show that this model successfully combines ecotheological ideals with bilingual learning techniques, despite obstacles such disparities in language skill levels and possible distractions from iPad use. The existence of a secure and accepting learning environment, which is essential to the Love-Based Curriculum, is reflected in students' greater willingness to engage and their growing confidence in speaking Arabic. Furthermore, the school subtly highlights that

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<sup>32</sup> UNESCO, *Education 2030: Incheon Declaration and Framework for Action for the Implementation of Sustainable Development Goal 4: Ensure Inclusive and Equitable Quality Education and Promote Lifelong Learning Opportunities for All* (2016), <https://unesdoc.unesco.org/ark:/48223/pf0000245656>.



ecological responsibility through the paperless system and communicative competence through Arabic bilingual learning are essential components of the role of human stewardship on earth (khalifah fi al-ard), which represents the core of a holistic ecotheological perspective, by connecting digital bilingual learning with the madrasah's vision of cultivating a Qur'anic generation proficient in global languages.

### **The Role of Teachers in Implementing Bilingual Education with a Love-Based Curriculum**

Research findings indicate that teachers play a central role in implementing bilingual learning based on the Love-Based Curriculum (KBC) at MTs QS UIN Imam Bonjol Padang. Teachers do not merely deliver content but also serve as primary role models in using dual languages (Indonesian-Arabic/English) with care and empathy. Through the KBC approach, teachers emphasize language use as a means to foster a respectful classroom atmosphere rather than just as an academic communication tool. Students reported feeling more motivated to use the target languages when teachers demonstrated patience, warmth, and consistency.

Furthermore, teachers act as facilitators in instilling values of love integrated into the bilingual learning process. They guide discussions with respect for peers, provide constructive feedback, and mentor students so that they not only become proficient in language but also maintain harmonious relationships. These findings show that the success of implementing KBC through bilingual education heavily depends on the extent to which teachers can internalize and model values of love in every classroom interaction. These findings are supported by research conducted by Orit Lavy, which demonstrates that teachers' caring behaviors and their sense of meaning in teaching significantly contribute to students' self-esteem, well-being, and school engagement. This suggests that when teachers consistently demonstrate care and positive relational values in their interactions, students are more likely to feel valued, engaged, and emotionally supported in the learning process.<sup>33</sup> The following data illustrate the role of teachers in the bilingual learning process.

**Table 3.** Students' Responses to Paperless Bilingual Learning

<b>Teacher's Role Aspect</b>	<b>Very Good</b>	<b>Good</b>	<b>Fair</b>	<b>Poor</b>
Serving as a role model in the use of bilingual language	18 (60%)	10 (33%)	2 (7%)	0 (0%)
Providing guidance using a love-based approach (KBC)	20 (67%)	8 (27%)	2 (6%)	0 (0%)
Facilitating discussions using the target language	15 (50%)	12 (40%)	3 (10%)	0 (0%)
Providing constructive feedback	16 (53%)	11 (37%)	3 (10%)	0 (0%)
Fostering mutual respect among students	21 (70%)	7 (23%)	2 (7%)	0 (0%)

Table 3 presents that the majority of students rated the teacher's role in implementing bilingual learning based on the KBC as "excellent." The aspect of fostering mutual respect received the highest score (70%), indicating that teachers successfully used language as a medium to internalize values of love and respect. On the other hand, although there were still some students who rated it as "adequate,"

<sup>33</sup> Shiri Lavy and Eman Naama-Ghanayim, "Why Care about Caring? Linking Teachers' Caring and Sense of Meaning at Work with Students' Self-Esteem, Well-Being, and School Engagement," *Teaching and Teacher Education* 91 (May 2020): 103046, <https://doi.org/10.1016/j.tate.2020.103046>.

their number was relatively small ( $\leq 10\%$ ). This suggests that, overall, teachers have performed optimally as role models and facilitators in connecting language competence with the values of love embedded in the KBC.

The quantitative data in Table 3 strongly suggest that the teacher's role as a model is the key to the successful integration of the Love-Based Curriculum (KBC) and bilingual education. The very high percentages in the "Excellent" category across all aspects (ranging from 50% to 70%) confirm that teachers are not merely teaching language material but are actively practicing KBC values. Specifically, the highest positive response (70%) for the aspect Fostering mutual respect indicates that teachers have successfully utilized bilingual discussion and interaction as a means to build an empathetic and supportive classroom community. This success directly addresses the previously discussed challenge regarding students' hesitation to speak, as a respectful classroom atmosphere cultivates the courage to experiment with the language without fear of making mistakes.

Furthermore, the consistency of high scores for Modeling bilingual language use (60% Excellent) and Guiding with a love-based approach (KBC) (67% Excellent) demonstrates that the model is holistically integrated. Teachers serve as a bridge connecting language proficiency with responsible behavior. This KBC principle, centered on care and mentoring, also implicitly supports Ecotheology values, where responsibility and care for the environment begin with responsibility and care for fellow human beings. In the context of paperless learning, the teacher's role-modeling extends to demonstrating the ethical and wise use of technology, reinforcing the message that resource efficiency, both paper and emotional resources, is part of a lifestyle imbued with love and respect.

### **Challenges in Implementing Bilingual Education Based on KBC**

Although the implementation of bilingual learning based on the Kurikulum Berbasis Cinta (KBC) at MTs QS UIN Imam Bonjol Padang shows positive outcomes, this study identified several challenges faced by both teachers and students. One of the main obstacles is limited foreign language proficiency, especially among students whose background provides limited exposure to bilingual learning from an early stage. These findings align with previous research in Indonesia, indicating that students in bilingual learning environments frequently encounter difficulties due to limited language proficiency, especially in communication and pronunciation. Such challenges are often associated with insufficient language exposure and varying levels of support from teachers and learning environment, which ultimately affect students' participation and learning outcomes.<sup>34</sup>

Other challenges relate to technical and emotional aspects. On the technical side, disruptions in digital devices or internet connectivity sometimes hinder the smooth implementation of paperless learning that supports bilingual education.<sup>35</sup>

<sup>34</sup> Septy Kumala Sari et al., "Creating an Effective Multilingual Learning Curriculum for Bilingual Students in Indonesia, Fostering Language Proficiency," *Journal of Technology, Education & Teaching (J-Tech)* 2, no. 1 (2025): 130–35, <https://doi.org/10.62734/jtech.v2i1.451>.

<sup>35</sup> Eka Yuliana Nurohmah and Siti Ma'rifah, "From Paper-Based to Digital Assessment: Adoption and Challenges of Learning Evaluation Applications in Islamic Education," *Journal of Educational Research and Practice* 3, no. 1 (2025): 107–22, <https://doi.org/10.70376/jerp.v3i1.206>.



Emotionally, some students feel hesitant or lack confidence in using the target language during discussions due to fear of making mistakes. This indicates that implementing bilingual education requires not only language proficiency but also the cultivation of a safe and caring psychological environment, enabling students to try and continue progressing. Therefore, these challenges demand adaptive strategies from teachers to ensure that the goals of bilingual learning based on the KBC are still achieved.

**Table 4.** Challenges in Implementing Bilingual Learning Based on KBC at MTs QS

Type of Challenge	Percentage	Description
Limited student language competence	45%	Many students are not yet accustomed to formal bilingual use
Teacher consistency in applying KBC	30%	Hindered by class heterogeneity
Technical issues with devices & network	25%	Fear of making mistakes in a foreign language
Student lack of confidence	35%	Fear of making mistakes in a foreign language
Limited learning time	20%	Restricts exploration of bilingual material

Based on Table 4, the most dominant challenges are students' limited language proficiency (45%) and lack of self-confidence (35%). This highlights that individual readiness is the primary obstacle in implementing KBC-based bilingual learning. Although technical issues and teacher consistency also occur, their percentages are relatively lower. Overall, these challenges indicate that the success of KBC-based bilingual learning depends not only on infrastructure or curriculum but also on students' psychological readiness and teachers' pedagogical skills to overcome obstacles with a caring approach.

The quantitative data in Table 4 clarify that the main challenges in implementing KBC-based bilingual paperless learning are pedagogical and psychological not merely technical. The dominance of issues surrounding limited student language competence (45%) and student lack of confidence (35%) highlights the need for student centered intervention. These challenges affirm that although the technology (paperless system) and the curriculum's intent (KBC) are in place, success still hinges on how teachers apply the principles of love and care to mitigate psychological barriers, especially the fear of making mistakes. The KBC must actively create a safe space that allows students with varying ability backgrounds to practice without the fear of judgment.

Although technical issues and teacher consistency in applying KBC have lower percentages (25% and 30%), these challenges still demand strategic attention. Technical problems, though minor, can disrupt the philosophy of Ecotheology if the paperless system becomes unstable, potentially creating distrust in digital solutions. Conversely, the issue of teacher consistency in dealing with classroom heterogeneity shows that the KBC is not a one-size-fits-all approach, but requires instructional differentiation. Therefore, counter-strategies must include continuous teacher training to enhance pedagogical skills in managing diverse classes, ensuring that the principles of love and respect can be applied equitably, even in the most challenging situations.

### Opportunities and Impacts of Implementing Bilingual Education with KBC

The implementation of KBC-based bilingual learning at MTs QS UIN Imam Bonjol Padang presents significant opportunities to strengthen students' competencies, both academically and character-wise. Academically, bilingual education helps students develop cross-linguistic thinking and expand access to global literature, while KBC instills empathy and care as foundational values for learning. This integration ensures that the learning process focuses not only on cognitive achievements but also on affective development aligned with the goals of Islamic education.<sup>36</sup>

Furthermore, another emerging opportunity is the growth of a healthy digital literacy culture. With the support of paperless learning, students are trained not only to access materials in two languages but also to select, process, and present information critically. This aligns with Arifin et al., who emphasizes that integrating bilingual education and digitalization can enhance 21st-century skills, particularly communication and collaboration.<sup>37</sup> Teachers at MTs QS also highlight that KBC provides an ethical framework, ensuring that technology use remains purposeful and strengthens meaningful learning.

In addition to these opportunities, the impact of KBC-based bilingual learning includes creating a more inclusive learning environment. Students from diverse backgrounds feel valued due to the caring approach fostered by teachers, increasing their self-confidence in using foreign languages. This supports findings by Suryani et al., showing that care-based learning reinforces students' psychological readiness to face academic challenges.<sup>38</sup> A safe and caring classroom environment makes bilingual learning more natural and sustainable.

Class observations show that when the teacher starts conversations with a friendly and encouraging manner and refrains from aggressively correcting errors, pupils become more comfortable speaking Arabic. Students are encouraged to actively participate in Arabic talks throughout class activities via this encouraging interaction. Students are therefore more inclined to practice asking questions, responding to their classmates, and expressing ideas in Arabic, which progressively enhances their speaking (*kalām*) proficiency and communication confidence.

According to student interviews, the care-based approach also makes pupils "unafraid to err," since teachers offer constructive criticism and corrections in a kind way. Students can experiment with new Arabic vocabulary (*mufradāt*) and sentence structures without worrying about looking foolish thanks to this teaching method. Students' accuracy and fluency in Arabic communication gradually improve with frequent opportunities to practice speaking in such a secure learning environment.

<sup>36</sup> Machmud Yunus et al., "Welcoming the Islamic Education Revolution: Adaptive Curriculum in Facing the Digital Era," *Jurnal Eduslamic* 3, no. 1 (2025): 27–36, <https://doi.org/10.59548/jed.v3i1.400>.

<sup>37</sup> Zainul Arifin et al., "Analyzing the Problems of Arabic Language Learning in Higher Education," *International Journal of Islamic Studies Higher Education* 3, no. 3 (2024), <https://insight.ppj.unp.ac.id/index.php/insight/article/view/193>.

<sup>38</sup> Yani Suryani et al., "Cooperative Learning with Reinforcement to Improve Student Motivation and Learning Outcomes on Praiseworthy Morals Material at MIS Ma'arif Salamal Huda," *Indonesian Journal of Education and Social Humanities* 1, no. 2 (2024): 55–62, <https://doi.org/10.62945/ijesh.v1i2.664>.



Additional teacher interviews reveal that combining bilingual education with the KBC framework creates a favorable classroom environment that promotes character development and language acquisition. Students must actively employ Arabic in relevant contexts as they participate in group discussions, peer explanations, and multilingual interactions in this setting. These activities not only enhance students' Arabic language proficiency, particularly in speaking and vocabulary acquisition, but also help them internalize the value of caring as an essential component of the learning process.

### **Integration Bilingual Education, KBC, and Ecotheology as a Holistic Education Model**

At MTs Quranic Scientia, UIN Imam Bonjol Padang, the integration of ecotheology, bilingual education, and the KBC constitutes a comprehensive educational framework that links language learning with moral and environmental principles. According to this concept, bilingual education serves as a pedagogical approach to help students become more proficient communicators, especially in Arabic, one of the target languages. Students are encouraged to actively participate in Arabic readings, conversations, and vocabulary while progressively improving their language skills using bilingual teaching methods.

The learning environment is shaped by the pedagogical foundation of the Love-Based Curriculum (KBC). KBC fosters a psychologically secure classroom environment where students feel comfortable learning Arabic, asking questions, and expressing ideas without worrying about making mistakes by placing a strong emphasis on empathy, respect, and encouraging interaction.<sup>39</sup> Because it improves students' motivation to engage in communicative activities, such an environment is crucial for successful language acquisition.

Ecotheology, on the other hand, links Islamic teachings about environmental stewardship (khalifah fi al-ard) with classroom activities to give the ethical and thematic background for learning.<sup>40</sup> Ecotheological issues can be included in vocabulary exercises, reading materials, and conversations regarding environmental responsibility from an Islamic perspective when learning Arabic. Through this combination, learning Arabic becomes a means of fostering spiritual ideals and ecological awareness in addition to being a language exercise.

Thus, the Love-Based Curriculum, ecotheology, and bilingual education come together to provide a comprehensive educational model where learning Arabic is enhanced with relevant thematic content and supported by a nurturing pedagogical atmosphere. With the help of this integrative framework, students can improve their

<sup>39</sup> Yesika Alfianingsih et al., "Arabic Learning Model in a Kurikulum Berbasis Cinta in a Madrasah," *Curricula: Journal of Curriculum Development* 5, no. 2 (2026), <https://ejournal-education.upi.edu/curricula/article/view/204>.

<sup>40</sup> Maulana Bagus Rahmat et al., "The Idea of Islamic Ecotheology in Responding to the Global Environmental Crisis: An Analysis of the Concepts of Khalifah, Mīzān, and Maṣlaḥah," *Indonesian Journal of Islamic Theology and Philosophy* 7, no. 1 (2025): 93–110, <https://doi.org/10.24042/ijitp.v7i1.27596>.

language skills while also becoming more ethically and environmentally conscious.<sup>41</sup>

Furthermore, this synergy demonstrates that Islamic education can transcend mere knowledge transfer to foster students' personal transformation. Through bilingual education, students access global texts; through KBC, they learn to respect diversity; and through ecotheology, they understand that caring for the Earth is part of their mandate as khalifah fil-ardh (vicegerents on Earth). In line with Rahmat, this integrated approach strengthens students' cognitive, affective, and psychomotor domains in a mutually supportive manner.<sup>42</sup>

In practice, teachers at MTs QS implement these three elements contextually. For instance, when teaching Arabic topics related to al-bi'ah (the environment), teachers not only focus on linguistic aspects but also emphasize the value of care in protecting the Earth according to Qur'anic teachings. This creates a more meaningful learning space, where students do not merely learn vocabulary but also develop an ethical commitment to the environment. As noted by Ratnasari et al., integrating ecological values into language learning cultivates both spiritual awareness and academic skills.<sup>43</sup>

Observations and interviews support these findings. In classroom discussions, students displayed higher enthusiasm when environmental topics were connected to Qur'anic verses and presented using a care-based approach. An interview with one teacher also emphasized that this holistic approach makes learning feel more relevant to students' daily lives. The teacher noted, "Children grasp the values more quickly when language, care, and the environment are integrated into a single learning flow." This underscores that the integration of bilingual education, KBC, and ecotheology is not merely a conceptual framework but actively shapes students' character and competencies.

Finally, certain limitations of this study must be acknowledged. As an intrinsic case study, the findings cannot be directly generalized to all madrasahs without contextual adaptation. Furthermore, the implementation of paperless learning depends on technological infrastructure and teacher readiness, which vary across regions. Nevertheless, this research provides significant empirical contributions. The model can serve as a reference, with local adjustments, to promote Islamic education that integrates technology, the values of care, and ecological awareness.

## Conclusion

This study shows how MTs Quranic Scientia's adoption of paperless multilingual education based on the Love-Based Curriculum (KBC) produces a novel Islamic educational paradigm that integrates digital technology, moral principles, and environmental consciousness. The results demonstrate that interactive learning

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<sup>41</sup> Sholihul Hadi, "The Influence of Awareness of Consequences, Internal Locus of Control, and External Locus of Control on Pro-Environmental Behavior in Students," *International Journal of Current Science Research and Review* 07, no. 08 (2024), <https://doi.org/10.47191/ijcsrr/V7-i8-82>.

<sup>42</sup> Rahmat et al., "The Idea of Islamic Ecotheology in Responding to the Global Environmental Crisis."

<sup>43</sup> Ratnasari et al., "The Integration of Eco-Theology in Sekolah Alam Yogyakarta."

activities that improve students' digital literacy and multilingual competency are made possible by the paperless system, which is supported by digital devices and e-learning platforms. Specifically, students are encouraged to actively engage in Arabic communication through the integration of bilingual instruction within a supportive KBC learning environment, which gradually strengthens their vocabulary mastery (*mufradāt*), reading comprehension (*qirā'ah*), and speaking confidence (*kalām*).

Additionally, learning Arabic is linked to Islamic teachings on environmental stewardship (*khalīfah fī al-arḍ*) through the incorporation of ecotheological ideals into bilingual learning activities. With this method, learning Arabic becomes a means of fostering spiritual responsibility and ecological awareness in addition to language proficiency. These results show that the Love-Based Curriculum, bilingual education, and paperless learning all help to provide a comprehensive learning environment in madrasah education that fosters character development and language acquisition.

Theoretically, this study advances the development of modern Islamic education by proposing an integrated framework that connects Arabic bilingual education with digital learning environments and ecotheological values. Practically, speaking, the model provides other madrasahs looking to enhance Arabic language instruction while encouraging care-based and ecologically conscious education with a possible point of reference.

However, the inherent case study design of this study, which was carried out within a single educational institution, places limitations on it. Future studies might look at how this concept is used in various Islamic educational settings and use mixed-method or quantitative approaches to learn more about how it affects digital literacy, environmental awareness, and Arabic language competency.

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## Author Contribution Statement

IR conceived the research idea, designed the study, and led the overall research process. ZZ contributed to data collection, qualitative data analysis, and the drafting of the manuscript. SIL assisted in literature review, theoretical framework development, and interpretation of findings. IA supported data collection, documentation analysis, and manuscript editing. All authors reviewed, revised, and approved the final version of the manuscript.

## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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