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Effectiveness of an Arabic PEGON Madura-Based Text Learning Strategy in *Bulugh al-Maram* on the Religious Literacy of Eighth-Grade Students at MTs Negeri 2 Gorontalo Regency

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ABSTRACT

This study addresses the limited use of local-script media in Islamic education by examining the effectiveness of a learning strategy based on Madura Arabic PEGON texts for enhancing students' religious literacy under the Merdeka Curriculum. The research aims to test whether PEGON-based instruction significantly improves the cognitive, affective, and practice dimensions of religious literacy among Grade VIII students at MTs Negeri 2 Gorontalo. Using a quasi-experimental pretest-posttest control-group design, 40 students were purposively selected and randomly assigned to an experimental class taught using PEGON Madura texts and a control class taught using standard Arabic texts over eight weeks. Religious literacy was measured using a validated test assessing knowledge, attitudes, and practices, complemented by classroom observations, student response questionnaires, and semi-structured interviews. Data were analyzed through descriptive statistics, normality and homogeneity tests, paired and independent samples t-tests, and Cohen's d to determine effect size. The findings show that the experimental group achieved a higher mean post-test score and gain (22.9) than the control group (8.1), with a very large effect size ($d = 5.1$) and statistically significant differences between pretest and posttest scores. Qualitative data indicate increased motivation, participation, and perceived relevance when PEGON texts are linked to students' cultural context. The study concludes that PEGON Madura-based learning is highly effective in strengthening religious literacy in madrasah settings. This research provides empirical evidence to address the quantitative gap in PEGON-based instruction and supports the integration of local-script PEGON media, potentially digital, into Islamic education curricula.



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Introduction

Islamic education in madrasah within the era of the Merdeka Curriculum places religious literacy at the center of efforts to strengthen the quality and relevance of spiritual learning in Indonesia.^[1] In this context, religious literacy is not merely defined as the ability to read religious texts literally, but also as the capacity to understand the meaning of Islamic teachings in context, engage in dialogue with the oral and written traditions of Islam Nusantara, and connect religious values with students' real-life experiences. The Merdeka Belajar-Kampus Merdeka (MBKM) policy underscores the urgency of enhancing students' literacy skills through learning processes that align with cultural backgrounds and the demands of 21st-century development. ^[2] The shift in learning emphasis from memorization toward information literacy, critical thinking, and context-based problem-solving has become a foundational pillar in revitalizing religious education.^[3]

However, despite the Merdeka Curriculum's encouragement of context-based and culturally relevant approaches, concerns remain that a nationally standardized curriculum may suppress local cultural diversity within religious learning. A strategy that overemphasizes uniformity across Indonesia risks sacrificing the uniqueness and richness of Islam Nusantara traditions, which should serve as the core of religious education in various regions. In this regard, although locally culture-based learning, such as Pegon Madura, can be a powerful tool for enhancing religious literacy, tensions arise between the desire to modernize the curriculum to meet global standards and the need to preserve the local wisdom that has long flourished within communities. The contextual approach encouraged by the Merdeka Curriculum may be difficult to implement evenly due to varying resources and differing levels of awareness across regions regarding the importance of culturally grounded learning. This raises essential questions about how religious education can remain relevant and contextual without losing its essence as a universal discipline applicable across diverse cultural backgrounds.

The Merdeka Belajar policy emphasizes the importance of applying the contextual teaching and learning (CTL) approach as a pedagogical foundation for linking religious texts with students' lived experiences and local cultural contexts.^[4] CTL is grounded in the notion that the learning process becomes more meaningful when instructional materials are connected to real-life situations and learners' social environments.^[5] In Islamic education, CTL serves as a strategic approach to instilling religious values through local experiences and cultural practices. Recent studies indicate that the application of CTL enhances critical thinking skills, creativity, and overall student learning outcomes.

Learning becomes more meaningful for students when they are given space to construct meaning based on concrete experiences.^[6] Within this policy framework, religious literacy is designed to develop students' capacity to read, understand, reason, and contextually apply Islamic teachings, in accordance with local culture.^[1] Literacy development in madrasah is oriented toward strengthening religious character and higher-order thinking skills through a curriculum that is more flexible and adaptive to social realities. Thus, religious literacy functions as a bridge between theological understanding and social practice, ensuring that religious education does not merely focus on mastering texts but also on internalizing spiritual values in daily life.^[7]

In alignment with this vision, learning practices in madrasahs also emphasize the use of media rooted in local culture and digital platforms. The integration of religious literacy, media literacy, and digital literacy has become essential for Islamic education to remain relevant in the digital era. This approach enables students not only to understand religious texts in traditional ways but also to interpret and critique them within modern sociocultural contexts.^[2] Consequently, Islamic education in madrasahs should shift from a memorization-based paradigm to a literacy-based paradigm that fosters reflective, critical, and contextual abilities.

The literary heritage of Islam Nusantara, such as the Madurese Arab Pegon, is highly relevant within this framework. Pegon functions not only as an Arabic-based writing system for local languages but also as a contextual medium that links Islamic teachings to local culture.^[8] In the context of madrasah, the use of Pegon Madura texts can enrich students' religious literacy by integrating linguistic, cultural, and spiritual elements into a dynamic and meaningful learning experience.^[9] Through this integration, madrasah can realize contextual learning aligned with the spirit of the Merdeka Curriculum, which is student-centered, culturally grounded, and oriented toward strengthening religious literacy rooted in Indonesia's Islamic traditions.

The theoretical framework of this study draws upon the integration of three main perspectives: religious literacy theory, contextual teaching and learning theory, and the semiotic-linguistic theory of PEGON Madura.[9] First, Religious Literacy Theory defines religious literacy as the ability to read, understand, interpret, and internalize Islamic teachings through texts, and to apply them to social and spiritual life. In the context of Islamic education, religious literacy also involves the capacity to contextualize the values of the Qur'an and Hadith so they remain relevant to modern society. This approach aligns with efforts to strengthen religious moderation through reflective learning and critical text-based Islamic literacy.[10]

Second, CTL theory emphasizes that learning becomes meaningful when students can connect the material with their experiences and cultural contexts.

In Islamic education, CTL is a pedagogical approach that links Islamic teachings to students' everyday lives.[11] Research on the application of CTL in madrasahs shows significant improvements in students' understanding of religious concepts when instruction is connected to cultural traditions and their social realities.[12] This approach enables the internalization of religious values through media and practices that are close to students' lived experiences, including through local religious texts such as PEGON Madura.[13]

Third, the semiotic-linguistic theory in the study of PEGON Madura posits that language and script function not merely as tools of communication but also as cultural symbol systems that encode spiritual values and reflect social identity.[14] Distinct characters such as $\ddot{\text{p}}$ (pa), $\ddot{\text{x}}$ (nga), $\ddot{\text{u}}$ (nya), and $\ddot{\text{c}}$ (ca) represent creative adaptations that illustrate the linguistic awareness of the Madurese community in integrating local phonology into the Arabic script system.[15] From a semiotic perspective, PEGON becomes a medium that bridges the revealed text with the cultural reality of society, making it a tool for religious literacy as well as a symbolic expression of Islam Nusantara.[16]

These three theoretical frameworks together form a conceptual synthesis that situates PEGON Madura-based learning as a contextual educational model that is literate, religious, and rooted in local culture. The integration of religious literacy, CTL, and semiotic-linguistic perspectives enable learners not only to understand Islamic teachings cognitively but also to internalize and manifest them in social and moral behavior. The instructional design emerging from this framework allows PEGON texts to function as reflective media that connect the language of revelation with local traditions, strengthening religious understanding while fostering appreciation for the literary heritage of Islam Nusantara.

Thus, the use of Arab PEGON Madura texts in madrasah education carries not only historical and linguistic value but also strong pedagogical relevance for enhancing students' religious literacy through contextualization. This approach supports the realization of integrative and sustainable Islamic education, one that integrates textual mastery, cultural understanding, and spiritual character formation in line with the Merdeka Curriculum's vision to produce learners who are religious, reflective, critical, and culturally grounded.[17], [18]

Qualitative studies on PEGON orthography have long been a focal point in understanding the writing system that connects the Arabic language to local languages, including in the Madurese context. PEGON, as a variant of the Arabic script modified to write regional languages in the Indonesian archipelago, functions not only as a writing system but also as a phonetic representation deeply connected to cultural and religious identity.[18] Research on PEGON orthography indicates that the modification of Arabic graphemes in PEGON aims to represent phonemes absent in Classical Arabic, such as /ŋ/ ($\ddot{\text{x}}$), /p/ ($\ddot{\text{p}}$), /n/ ($\ddot{\text{u}}$), and /c/ ($\ddot{\text{c}}$), which are specifically used in local languages such as Madurese.[19], [20]

Further studies on PEGON Madura emphasize that these modified characters are not merely phonetic adaptations but also symbolic components of the Madurese community's religious identity. PEGON is integrated into spiritual life and pesantren education, functioning as a medium for teaching classical Islamic texts (kitab kuning) and strengthening students' understanding of Islamic scholarship.[21] In this context, PEGON is not only a reading tool but also a symbol of the preservation of Islamic scholarly traditions and a means of transmitting moral values through educational practices rooted in local culture.[22]

In the setting of pesantren learning, PEGON Madura has been shown to play an essential role in religious instruction, particularly in the study of classical texts.[23] Several studies indicate that PEGON is used to help students understand classical Arabic texts, which are often difficult to comprehend without interpretation into a local language.[24] PEGON instruction in pesantren that adopt a literacy-based approach demonstrates that PEGON functions not only as a writing system but also as a vehicle for reinforcing religious

morals and ethics among students.[21] This approach also includes integrating technology into Pegon instruction, such as Android applications and digital media, to enhance students' writing and reading skills and enrich their learning experiences in pesantren.[25]

Despite Pegon's clear role in preserving Islamic values and facilitating religious education in pesantren, there remains a significant research gap regarding the effectiveness of Pegon-based learning in modern madrasah settings. Many studies focus on the philological and semiotic aspects of Pegon, as well as its connection to cultural and religious identity. Yet, few have examined Pegon's impact on improving students' religious literacy in formal madrasah education. Research on local media and technology integration in Pegon learning in pesantren has demonstrated strong potential to enhance students' motivation and spiritual comprehension.[20] However, the implementation of culture-based learning, particularly in madrasah contexts, remains underexplored. To date, studies on Pegon largely concentrate on qualitative and philological analyses, examining its letter forms, orthographic structures, and the cultural meanings embedded in the writing system. These studies often highlight how Pegon functions as a modified Arabic script that reflects local phonology and contributes to cultural and religious identity within the Nusantara Islamic tradition, particularly in pesantren education. Nevertheless, most of this research remains limited to linguistic and semiotic analyses, focusing on Pegon's characteristics within local culture without exploring its impact on learning processes and student learning outcomes.

However, there remains a significant gap in the literature on quantitative-experimental research examining the effectiveness of Pegon-based learning on student learning outcomes, particularly in the domain of religious literacy. Although Pegon-based instruction has the potential to enhance students' religious understanding through the integration of religious texts and local culture, very few studies have examined the concrete impact of Pegon-based learning strategies on religious literacy in contemporary madrasah contexts. This study seeks to address this gap by collecting empirical data through a quantitative approach at MTs Negeri 2 Gorontalo, enabling a more measurable and structured examination of the influence of Pegon-based texts on students' religious literacy.

These findings highlight a gap in the literature that explores the contextual impact of Pegon-based learning on madrasah students' religious literacy. Religious instruction that uses Arab Pegon texts, particularly in Madurese contexts, has rarely been examined quantitatively to assess improvements in understanding of spiritual values, learning motivation, and spiritual literacy. Most prior research has focused on qualitative studies of Pegon orthography and pesantren education, with limited attention to evaluating the effectiveness of Pegon-based instruction in madrasah settings that integrate local culture and technology. Therefore, this study aims to address this gap by examining the effect of Pegon Madura-based learning on students' religious literacy using a quantitative experimental design with pre- and post-tests, while situating the results within a broader educational framework.

Thus, this study emphasizes the use of Pegon Madura as a contextual learning medium that not only aligns with local culture but also has the potential to enhance students' religious literacy within the framework of the Merdeka Curriculum. The present research contributes to the literature by demonstrating the effectiveness of local cultural media in religious education at madrasahs, particularly in improving students' understanding of Islamic teachings through localized, culturally grounded Islamic texts.

This study empirically examines the influence of Pegon-based learning strategies on students' religious literacy, using a theoretical framework that integrates the Religious Literacy Framework, CTL, and principles of Madurese local wisdom. Within this framework, religious literacy is conceptualized through three core dimensions: cognitive (knowledge and understanding of religious concepts), affective (values, attitudes, and dispositions toward religious teachings and communities), and practical (the capacity to apply religious knowledge and values in real-life actions). These dimensions are highly relevant to the Madurese context, which is enriched with religious traditions and Islamic practices deeply integrated into daily life, including pesantren culture and local religious practices.[26], [27], [28]

The Religious Literacy Framework is employed as the conceptual lens for examining students' religious literacy. Within this framework, religious literacy is not limited to the mechanical ability to read texts but also encompasses the capacity to interpret, understand, and embody Islamic values in daily life. By using

Pegan Madura texts as instructional media, this study investigates how Pegan-based learning can enhance religious literacy across its three dimensions. Accordingly, the relationship between Pegan Madura-based learning strategies (independent variable) and students' religious literacy (dependent variable) is constructed within these cognitively, affectively, and practically interconnected dimensions.[26]

CTL is used as a learning mechanism that enables students to understand the meaning of lesson content through their real-life contexts.[29] CTL emphasizes real-world relevance and fosters student motivation by linking instructional materials to concrete experiences, actions, and reflection.[30] In this regard, Pegan Madura texts, which are deeply rooted in local cultural and religious traditions, are highly relevant to CTL-based instructional strategies. The application of CTL in Pegan Madura learning has the potential to increase student engagement, enrich learning experiences, and support their understanding of Islamic teachings within their socio-cultural context.[30], [31][32]

Principles of local wisdom play an essential role in bridging Pegan Madura-based instructional strategies and students' religious literacy. Madurese local wisdom, including cultural values, pesantren traditions, and local religious practices, serves as an educational context that strengthens the relevance of spiritual content and enhances students' motivation to study Islamic texts. Research shows that integrating local wisdom into education, particularly religious education, can reinforce cultural literacy and support more moderate and contextual religious understanding.[33]

Practically, this theoretical framework positions Pegan Madura-based instructional strategies as the independent variable, operationalized through the CTL approach to connect religious material with the local cultural context of Madura, specifically through the dimensions of religious literacy (cognitive, affective, and practical). The principles of Madurese local wisdom strengthen the community's cultural context, identity, and values, thereby facilitating relevant and meaningful learning for students. CTL-related instructional resources, such as CTL-based learning tools and contextual media, provide a methodological foundation for designing learning activities that integrate Pegan Madura texts with students' daily lives, thereby making the learning process more relevant and experiential.[34]

In this study, a quantitative approach is employed to examine the relationship between the Pegan Madura empirically based learning strategy (independent variable) and students' religious literacy (dependent variable). The justification for using a quantitative design lies in its widespread use in educational research to evaluate the effectiveness of instructional strategies and to assess associations between learning interventions and students' skills using tests, questionnaires, and other measures [31]. The quantitative design employed in this research uses an experimental or quasi-experimental framework that enables direct testing of the impact of the Pegan Madura-based learning strategy on students' religious literacy, measured by pre- and post-tests.

Religious literacy is assessed across three dimensions: cognitive (religious knowledge and understanding), affective (attitudes and values toward Islamic teachings), and practical (the ability to apply Islamic teachings in daily life). Instruments for measuring these dimensions include knowledge tests (cognitive), attitude questionnaires (affective), and assessments of religious practices (practical). The Pegan Madura-based learning design, integrated with the CTL approach and Madurese local wisdom, is evaluated to determine its influence on these dimensions, to enhance students' comprehension, appreciation, and enactment of Islamic values in their daily activities. [26]

Operationally, the independent variable in this study is the Pegan Madura-based instructional strategy, operationalized through CTL principles that connect Islamic teachings with the Madurese cultural context, including local religious practices and pesantren traditions. The dependent variable is students' religious literacy, measured across the cognitive, affective, and practical dimensions. The purpose of this research design is to assess the extent to which Pegan Madura-based instruction influences students' religious literacy using relevant quantitative instruments and appropriate data analysis techniques.

The main hypothesis proposed in this study is:

H1: The Pegan Madura-based learning strategy has a positive effect on students' religious literacy. An additional hypothesis (H2) suggests that the effect of the Pegan Madura learning strategy on religious literacy is mediated by the implementation of CTL and the integration of Madurese local wisdom, which contextualizes the learning process within students' cultural backgrounds, thereby strengthening the relevance and motivational aspects of learning Islamic values.

Method

This study employed a quasi-experimental pretest–posttest control-group design to assess the effectiveness of the Pegon Madura–based Arabic text learning strategy in improving eighth-grade students' religious literacy at MTs Negeri 2, Kabupaten Gorontalo. The research subjects were divided into two groups: the experimental group, which received instruction using Pegon Madura texts, and the control group, which received conventional instruction using standard Arabic texts. Each group consisted of 20 students, yielding a total sample of 40 participants selected through purposive sampling, with consideration of comparable initial abilities and commitment to completing all stages of the study.

The study was conducted over four instructional sessions within eight weeks. Before the intervention, both groups completed a pre-test to measure their initial levels of religious literacy. Subsequently, the experimental group received Pegon Madura–based instruction, whereas the control group participated in conventional instruction. At the end of the instructional sequence, both groups were administered a post-test to assess gains in religious literacy following the intervention.

The instruments used in this study included a religious literacy test comprising three key dimensions: cognitive (knowledge and understanding of Islamic teachings), affective (students' attitudes and values toward Islamic teachings), and practical (the ability to apply Islamic teachings in daily life). The test instrument comprised multiple-choice items and short-answer questions that had undergone validity and reliability testing. In addition, observation sheets were used to assess the learning process, and a student response questionnaire was utilized to measure their level of participation and motivation throughout the instructional activities.

The research procedure began with the administration of a pre-test to both groups to assess students' levels of religious literacy before the intervention. Following this initial stage, the experimental group received Pegon Madura–based instruction that connected religious material to the local Madurese cultural context. The instruction was carried out using various Pegon Madura texts aligned with Islamic teachings and relevant to students' daily lives. Meanwhile, the control group underwent conventional instruction using standard Arabic texts without the integration of local cultural elements.

After the treatment sessions were completed, both groups were administered a post-test identical to the pre-test instrument to assess changes in religious literacy following the intervention. Throughout the instructional process, observations were conducted in each session to document classroom dynamics, levels of student engagement, and students' responses to the use of Pegon Madura texts. In addition, interviews with teachers and students were conducted to obtain supplementary qualitative data regarding the effectiveness of the implemented instructional strategy.

Data from the pre-test and post-test were analyzed using descriptive statistics to present mean scores before and after the treatment. To examine differences within each group, a paired-samples t-test was used to assess whether pre-test and post-test scores differed significantly in both the experimental and control groups. Furthermore, to quantify the impact of Pegon Madura text–based instruction on students' religious literacy, the effect size was calculated using Cohen's d .

All stages of this research were conducted in accordance with ethical principles in educational research, including obtaining approval from the school, teachers, and students' parents, and ensuring the confidentiality and anonymity of participants' personal data. Students participated voluntarily after receiving a clear explanation of the research objectives and procedures. They were also permitted to withdraw at any time without consequences. Moreover, all data collected through tests, observations, and interviews were kept confidential, and the research findings were transparently communicated to relevant stakeholders.

This study is expected to provide strong empirical evidence regarding the effectiveness of the Pegon Madura text–based learning strategy in improving students' religious literacy in the madrasah context. The findings are also expected to contribute to curriculum development and to the advancement of culturally grounded and contextually relevant instructional approaches in Islamic religious education.

Results and Discussions

This study aims to evaluate the effectiveness of the Pegon Madura–based Arabic text-learning strategy on the religious literacy of eighth-grade students at MTs Negeri 2, Kabupaten Gorontalo. The analysis

indicates a significant improvement in students' religious literacy among the experimental group after receiving instruction using Pegan Madura texts. The mean post-test score of the experimental group increased substantially relative to the pre-test score, indicating that the learning strategy had a positive impact on students' understanding of Islamic teachings.

Meanwhile, the control group, which received conventional instruction, experienced a relatively smaller increase, although some improvement in their understanding was still observed. The difference in improvement between the two groups is evident in a comparison of the pre-test and post-test mean scores, which will subsequently be analyzed using statistical tests. Before conducting inferential analysis, a normality test was performed to verify that the data met the assumption of normality required for subsequent statistical testing.

Tabel 1. Descriptive Statistics of Pre-test and Post-test Results

Kelompok	Rata-rata Pretest	SD Pretest	Rata-rata Posttest	SD Posttest	Rata-rata Gain
Kontrol	59,6	2,42	67,7	2,48	8,1
Eksperimen	60,1	2,58	83,0	2,94	22,9

Based on the table above, the mean post-test score for the experimental group is higher than that for the control group. This indicates a significant improvement in the experimental group following the implementation of the Pegan Madura-based Arabic text-learning strategy. The improvement observed in the control group was moderate due to conventional instructional methods. In contrast, the experimental group experienced a greater increase due to the innovative use of contextual Pegan Arabic text media.

1. Normality and Homogeneity Tests

The normality of the data was assessed using the Shapiro-Wilk test. Furthermore, Levene's test for homogeneity of variance indicated that the p-value exceeded 0.05 for both the pre-test and post-test. This shows that the variances of the two groups were homogeneous, thereby permitting the use of parametric tests, such as the t-test, in subsequent analyses.

Table 2. Tests of Normality

kelas	Kolmogorov-Smirnov ^a			Shapiro-Wilk			
	Statistic	df	Sig.	Statistic	df	Sig.	
hasil	Pr.K	.106	20	.200*	.950	20	.367
	Po.K	.120	20	.200*	.941	20	.249
	Pr.E	.115	20	.200*	.956	20	.473
	Po.E	.143	20	.200*	.934	20	.184

a. Lilliefors Significance Correction

*. This is a lower bound of the true significance.

All significance values were greater than 0.05 ($p > 0.05$), based on both the Kolmogorov-Smirnov and Shapiro-Wilk tests. Thus, it can be concluded that the data from all groups were normally distributed. These results indicate that the data in this study meet the normality assumption required for conducting parametric statistical analyses, such as the paired-sample t-test and the independent-sample t-test. Therefore, parametric analysis techniques can be validly used to test the research hypotheses.

Table 3. Test of Homogeneity of Variance

		Levene Statistic	df1	df2	Sig.
hasil belajar siswa	Based on Mean	2.506	1	98	.117
	Based on Median	1.967	1	98	.164
	Based on Median and with adjusted df	1.967	1	96.328	.164
	Based on the trimmed mean	2.559	1	98	.113

A homogeneity test was conducted to assess whether the variances of the two groups (control and experimental) were homogeneous. Homogeneity is a prerequisite for parametric statistical analysis, particularly when an independent-samples t-test is used. In this study, the homogeneity test was performed using Levene's Test for Equality of Variances with a significance level (α) of 0.05.

Based on the results of the homogeneity test obtained from the SPSS output (Levene's Test table), the significance value (Sig.) was greater than 0.05 ($p > 0.05$) for both the pre-test and post-test data of the control and experimental groups. This indicates that the variances of the two groups were homogeneous, implying no significant difference between the control and experimental classes.

Thus, the assumption of homogeneity of variance was met, allowing the data to be analyzed using an independent-samples t-test to examine differences in learning outcomes or levels of religious literacy between the two groups following implementation of the Pegan Madura-based Arabic text learning strategy.

These results also reinforce that the differences in mean scores analyzed in the subsequent stage are attributable solely to differences in instructional treatment, not to unequal variances between the groups.

2. Paired-Sample t-Tes

Table 4. Group Statistics

	kelas	N	Mean	Std. Deviation	Std. Error Mean
nilai	Pretest eksperimen	20	67.20	2.608	.583
	Posttest eksperimen	20	82.35	3.249	.726

A paired-samples t-test was used to assess whether there was a significant difference between pre-test and post-test scores within the same group, specifically the experimental class that received the Pegan Madura-based Arabic text learning strategy.

Table 5. Independent Samples Test

	Levene's Test for Equality of Variances	t-test for Equality of Means							
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference
nilai	Equal variances assumed	1.671	.204	16.263	38	.000	-15.150	.932	-17.036
	Equal variances not assumed.			16.263	36.300	.000	-15.150	.932	-17.039

Based on the analysis results presented in the table above, the obtained value was $t = -151.806$ with $df = 19$ and a significance value (Sig. (2-tailed)) of 0.000. This p-value is smaller than the significance level $\alpha = 0.05$ ($p < 0.05$). Thus, it can be concluded that there is a highly significant difference between the pre-test and post-test scores of the experimental group.

The mean difference of -22.300 indicates that the post-test scores were higher than the pre-test scores. This shows that, following treatment with the Pegon Madura-based Arabic text learning strategy, students' religious literacy increased significantly.

Therefore, it can be concluded that the Pegon Madura-based Arabic text learning strategy is effective in improving eighth-grade students' religious literacy at MTs Negeri 2, Kabupaten Gorontalo. These results support the research hypothesis that the use of Pegon Arabic texts in the learning process positively affects students' understanding of religious material.

3. Effect Size (Cohen's d)

Effect size analysis is used to quantify the magnitude of the treatment's impact on students' learning outcomes. In this study, the effect size was calculated using Cohen's d, which compares the mean difference between the experimental and control groups to their standard deviation.

Table 6. hasil effect size

kelas	Rata-rata gain	Standar deviasi	Effect size	keterangan
eksperimen	67,20	2.608		
kontrol	82,35	3.249	5,1	besar

Based on the calculation results, the obtained Cohen's d value was 5.1. According to Cohen's (1988) interpretation criteria, effect size categories can be classified as follows:

d = 0,2 → *small effect*

d = 0,5 → *medium effect*

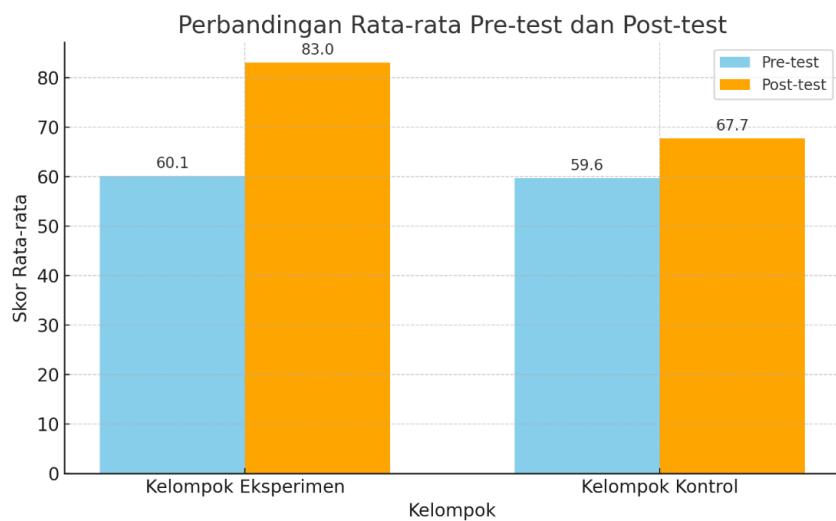
d ≥ 0,8 → *large effect*

Thus, an effect size value of 5.1 falls into the category of a very large effect. This indicates that the implementation of the Pegon Madura-based Arabic text learning strategy had a strong and significant impact on students' religious literacy.

The difference in mean learning outcomes between the experimental group (82.35) and the control group (67.20) indicates that the use of Pegon Arabic texts not only enhanced students' understanding of religious material but also strengthened their motivation and engagement in the learning process.

Practically, these findings affirm that Pegon Madura-based Arabic text instruction can serve as an effective strategy for enriching religious literacy in the madrasah setting, particularly because this approach integrates local cultural values with contextualized religious understanding.

4. Data Visualization



The graph shows that the experimental group experienced a significant increase from the pre-test to the post-test. In contrast, the control group also showed an improvement, albeit with a smaller magnitude.

5. Supporting Qualitative Analysis, Implications, and Additional Findings

The Pegon Madura-based learning model demonstrated a highly positive impact on students' religious literacy. Alongside the quantitative results confirming a significant improvement in students' comprehension and reading skills, the qualitative analysis provides a more comprehensive and in-depth picture of how the learning experience unfolded in the classroom. Observations during the instructional process revealed that students were more easily able to engage with the learning flow when texts were aligned with cultural elements and linguistic sounds familiar to them. This was reflected in students' increased willingness to ask questions, their heightened interest in the lesson content, and their improved ability to articulate the religious information they had learned.

Interviews with the teacher revealed that the use of Pegon Madura texts not only facilitated students' access to religious materials but also provided teachers with broader opportunities to connect the lesson content with students' real-life experiences. The teacher reported that students became more active, expressive, and more eager to understand verses, hadiths, and moral texts presented in the Pegon script. Students also demonstrated heightened emotional engagement; they were not merely reading but internalizing the texts' meanings because the linguistic form was closely tied to their cultural identity. In class discussions, students found it easier to relate the religious values they learned to their personal experiences, local traditions, and spiritual practices within their families and communities.

One of the most striking qualitative findings was the high level of enthusiasm among students for Pegon Madura-based learning. Before the treatment, many students struggled to understand religious-education texts in Arabic because of differences in language and sentence structure relative to standard Arabic. However, after being introduced to Pegon texts adapted to local phonology and structured in a manner more accessible to students, they felt more connected to the material and more comfortable participating in the learning process.

According to the students interviewed, they found it easier to understand the spiritual meanings in the religious texts because the language used—Madura—was familiar to them and was heard in their daily lives. One student stated, *"By using Pegon Madura, I can understand the meaning of the text more quickly and immediately relate it to my life here. The text feels closer to me."*

This indicates that Pegon Madura texts function not only as reading tools but also as bridges that connect religious teachings with students' lived experiences grounded in local wisdom. By using a writing system that more closely aligns with local phonology, religious learning becomes more accessible and relatable to students. They no longer feel distanced from religious texts, as the Pegon script presents a linguistic form that resonates with their social and cultural experiences. This sense of connection creates a warmer, more inclusive learning environment in which students can internalize Islamic values through a linguistic medium embedded in their

own community. Moreover, the use of PEGON MADURA facilitates a more natural process of value internalization, as religious texts are not perceived merely as normative rules but as part of a spiritual identity inherited from one's ancestors and immediate environment.

Beyond improvements in reading skills and text comprehension, PEGON MADURA-based learning also enhanced students' understanding of religious values. Interviews with teachers revealed that the spiritual values taught through PEGON MADURA texts were easier for students to understand and apply in their daily lives. Teachers reported observing greater student engagement in class discussions regarding the meaning and application of Islamic teachings because the students felt a stronger connection to the texts.

The use of PEGON MADURA enables teachers to link religious teachings to local culture that is already familiar to students. For instance, in lessons on Islamic ethics (*akhlak*), teachers presented examples related to local Madurese traditions, such as hospitality, mutual respect, and tolerance—values deeply embedded in the local community's culture. Students were then given opportunities to analyze and reflect on how these values align with Islamic teachings.

Several students reported feeling more inspired to practice religious values in their daily lives after studying PEGON MADURA texts. For example, one student said, *"After reading and understanding the texts written in PEGON MADURA, I feel I can apply religious teachings better in my relationships with friends and family. I've become more aware of the importance of cooperation and respecting others."* This indicates that PEGON MADURA-based instruction influences not only students' cognitive understanding but also their affective relationship with religious teachings, ultimately shaping their character and social ethics. This aligns with the Religious Literacy Framework, which emphasizes that religious literacy extends beyond theological knowledge to encompass affective and practical dimensions in everyday life.

Increased Student Engagement and Learning Motivation

One of the major advantages of PEGON MADURA-based instruction is the noticeable increase in student engagement and learning motivation. Classroom observations revealed that students in the experimental group were more active in discussions and class participation. They asked more frequently about the texts and expressed their opinions on the meaning of Islamic teachings in the PEGON MADURA materials. Learning became more interactive as students felt personally connected to the content.

Teachers also reported that although they taught the same material to both the experimental and control groups, the experimental group demonstrated greater motivation and interest in the lessons. Collaborative activities—such as group discussions and presentations on PEGON MADURA texts—were more lively and dynamic in the experimental class. One teacher noted, *"They are more interested and actively engaged in the learning process. I also see that they are more confident in reading and explaining PEGON MADURA texts."*

This suggests that a contextual approach grounded in students' local culture can strengthen their engagement with the learning material, thereby enhancing their learning outcomes. When students feel that what they are learning is directly connected to their lives, language, and cultural identity, the learning process is no longer perceived as something detached from everyday reality. Instead, learning becomes a personal, relevant, and meaningful experience.

This aligns with the principles of Contextual Teaching and Learning (CTL), which emphasize linking instruction to concrete experiences and real-life contexts so that learning materials can be understood more deeply and sustainably. In the context of PEGON MADURA, the use of scripts and texts familiar to students provides them with a sense of familiarity and cognitive comfort, making it easier for them to absorb religious messages and motivating them to apply these teachings in their daily lives.

Practical Implications for Curriculum Development

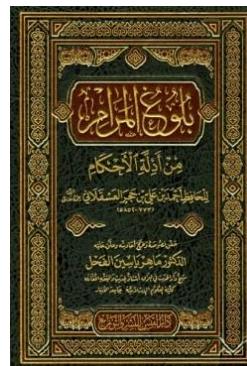
The findings from this study have significant implications for the development of religious education curricula in madrasahs. PEGON MADURA-based learning demonstrates that relevant local media can enrich students' learning experiences, particularly in religious literacy. By integrating PEGON MADURA texts into the curriculum, madrasahs can provide more contextualized education rooted in local culture, thereby enhancing religious understanding and strengthening students' religious identity.

Additionally, the results of this study can inform the development of teaching strategies that prioritize active student participation through methods that encourage discussion, collaboration, and personal reflection. Therefore, the use of culturally grounded media, such as PEGON MADURA, can serve as an effective learning model for fostering deeper student engagement in the teaching-learning process.

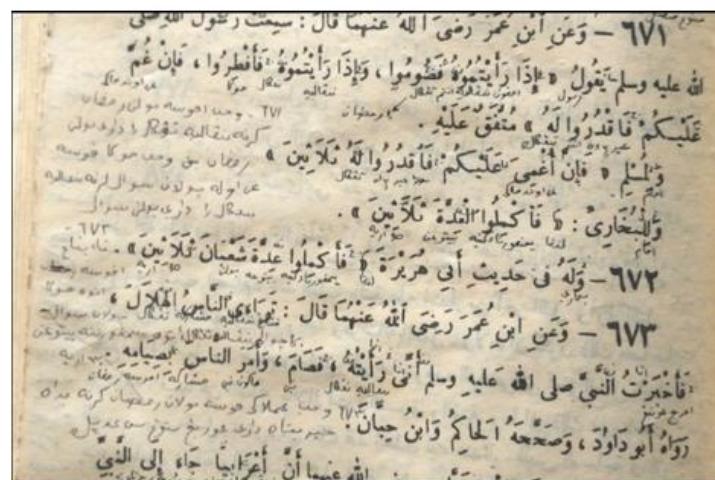
Additional Findings: Digitalization and Technology in PEGON Learning

One important additional finding in this study was the use of digital media to support PEGON Madura-based learning. Some teachers reported using digital applications and technology-based platforms to facilitate instruction in PEGON writing and reading. The use of Android-based applications that support the PEGON script recognition has enhanced students' accessibility and interactivity. This creates opportunities to develop PEGON learning using modern technology, which can be applied in madrasahs across Indonesia.

The use of technology in PEGON learning also shows great potential in expanding access to religious materials that are difficult to reach with conventional methods. For example, the use of virtual PEGON keyboards enables students to write in the PEGON script on digital devices, facilitating their interaction with religious texts in digital formats.



Picture 1. The Book of Bulughul Maram



Picture 2. Manuskrip kitab Bulughul Maram

(Written by: Al-Hafidz Ibnu Hajar Al-Asqalani; Source: Contribution by Mas'udi Eko Diansyah, S.Pd.I, 2015)

The second image shows classical Arabic text flanked by Madurese marginal notes in the PEGON script. These notes serve as a syarah (explanatory notes) to help students understand the meaning of the verse or hadith.

Transliteration example:

Napa maksodna ayat niki, lamun oreng ngelampahi amal sonnat, kaangguy nambah pahala.

(Meaning: This verse explains that if someone performs voluntary deeds, they will gain more rewards.)

This language pattern indicates that PEGON was used not only as a writing tool but also as a pedagogical tool that bridged Arabic and Madurese in the context of traditional Islamic education.

Discussion

This study demonstrated that the use of PEGON MADURA Arabic texts in religious education at MTs Negeri 2, Kabupaten Gorontalo, had a positive and significant impact on students' religious literacy across the cognitive, affective, and practical dimensions. The improvement observed in the experimental group using PEGON MADURA texts indicates that culture-based learning can enhance students' understanding of Islamic teachings in a way that is more personally connected and relevant to their daily lives.

One key finding that warrants emphasis is the significant improvement in the experimental group's understanding of religious texts. This was reflected in the pre-test and post-test results, which showed an increase in the experimental group's average scores using PEGON MADURA texts. This improvement extended beyond theological knowledge to students' ability to interpret and apply religious teachings in their daily lives. This reinforces the Religious Literacy Framework, which asserts that religious literacy must encompass three main dimensions: knowledge, attitude, and practice [9]. PEGON MADURA-based learning integrates local language with spiritual values, making the instructional material more connected to students' worldviews.

Additionally, PEGON MADURA-based learning demonstrates that students' emotional engagement in religious learning also increased. Students who studied PEGON MADURA texts found it easier to understand spiritual values because they could interpret these texts in a language more familiar to them. As Hannan (2022) states, culture-based learning can strengthen students' religious identity, thereby encouraging them to internalize Islamic teachings more deeply [28].

Students' acceptance of PEGON MADURA-based learning was very high, as evidenced by greater enthusiasm for participating in the learning process.

Based on student interviews, students reported that PEGON MADURA texts made religious teachings easier to understand because the language was more comprehensible and more relevant to their daily lives in Madura. One student stated, "I find it easier to understand religious texts using PEGON MADURA because the language is closer to me. I can immediately relate the religious teachings to my everyday experiences." This finding supports the Contextual Teaching and Learning (CTL) theory, which emphasizes that learning becomes more meaningful when the material is connected to students' real-life contexts. In this case, the use of PEGON MADURA as a learning medium links religious teachings with local wisdom already familiar to the students, making the learning process more meaningful and emotionally connected. Research by Rohman et al. (2023) also shows that CTL can increase student engagement in learning, thereby improving their learning outcomes [34].

Although the experimental group showed greater improvement, the control group, which used conventional learning methods, also showed some improvement in religious literacy. However, the increase was not as significant as in the experimental group. This indicates that traditional learning methods, which rely on standard Arabic texts without connecting to students' local cultural contexts, are limited in fostering deep engagement with the material. This study aligns with findings by Kustini (2023), who states that learning that does not integrate local cultural contexts can make the learning experience feel less meaningful to students, thus lowering their motivation and active participation [13].

One of the main contributions of this study is to fill a research gap regarding the impact of culture-based learning, specifically PEGON MADURA texts, on religious literacy in madrasah education. Most existing research has focused on the linguistic and semiotic aspects of PEGON and its connection to cultural identity. Still, few have directly examined its effect on students' learning outcomes in religious literacy. Thus, this study provides empirical evidence that PEGON MADURA-based learning has a significant positive impact on improving students' religious literacy.[35], [36]

The practical implication of this research is that integrating culture-based learning into the religious education curriculum can enhance students' understanding of religion, strengthen their religious identity, and motivate them to be more active in applying religious values in their daily lives. Therefore, the use of PEGON MADURA texts in madrasahs can be an effective strategy to enrich students' religious literacy.[37], [38]

More broadly, this study suggests that culture-based media, such as Pegon Madura, can serve as an effective strategy for developing the religious education curriculum in madrasahs. A curriculum based on local culture that integrates Pegon Madura texts will be more relevant to students' life contexts, making it easier for them to understand Islamic teachings, not only theologically but also in the practical aspects of their daily lives. Additionally, such a curriculum can strengthen students' cultural identity and make religious education more meaningful and engaging.[39], [40]

This study also found that the use of technology to support Pegon Madura learning can enhance accessibility and interactivity. Most students in the experimental group used Android-based applications to learn the Pegon script, which facilitated their interaction with texts and their ability to write it.[41], [42]

This indicates that the digitalization of Pegon learning has the potential to enrich students' learning experiences, provide broader access to religious materials, and introduce technological innovations into religious education. The application of technology in Pegon Madura learning also presents significant opportunities to develop more interactive and relevant Pegon-based learning applications that meet students' needs in the digital age. This aligns with research by Wijaya et al. (2021), which states that technology-based learning media can enrich learning experiences and increase student motivation in religious education.[43], [44]

Conclusion

Based on the research findings, it can be concluded that the Pegon Madura-based Arabic text learning strategy has a significant positive impact on the religious literacy of eighth-grade students at MTs Negeri 2 Kabupaten Gorontalo. Pegon Madura-based learning has been shown not only to enhance students' understanding of religious texts but also to strengthen their motivation to participate in religious education. This is reflected in the significant improvement in the experimental group's average post-test scores with Pegon Madura texts compared with the control group's scores using conventional learning methods. The use of Pegon Madura texts enables students to more easily understand the spiritual meanings embedded in religious texts, as the language used is more relevant and familiar to them.

This study also addresses an existing research gap regarding culture-based learning, particularly the use of Pegon Madura texts, in the context of religious literacy in madrasahs. Most previous studies have focused on the linguistic and semiotic aspects of Pegon and its influence on cultural identity, but few have directly examined its impact on students' religious literacy. This study provides empirical evidence that Pegon Madura-based learning can improve reading skills, understanding of spiritual teachings, and the application of spiritual values in students' daily lives.

Pegon Madura-based learning not only impacts students' theological knowledge but also their attitudes and values. Students engaged in this learning process show a positive attitude toward Islamic teachings and become more actively involved in religious education. They feel more emotionally connected to the material being taught, as the texts used are closer to their cultural context, specifically Madurese culture. This supports the Contextual Teaching and Learning (CTL) theory, which emphasizes that learning becomes more meaningful when instructional materials are linked to students' life experiences and social contexts.

The implications of this study are crucial for the development of the religious education curriculum in madrasahs. By incorporating Pegon Madura texts into the curriculum, madrasahs can provide learning materials that are more relevant to and connected with students' worldviews, thereby improving their religious literacy. The implementation of Pegon Madura-based learning can also strengthen students' religious identity, as they learn to engage with religious teachings through the language and script deeply embedded in their traditions. This will create a closer connection between spiritual teachings and students' everyday life practices.

Furthermore, the findings of this study provide opportunities to develop technologies that support Pegon Madura learning. Digital applications based on the Pegon script, such as virtual Pegon keyboards and Android-based platforms, can help students learn the Pegon script more interactively and dynamically. Such technology can expand access to learning, making it easier for students across regions to engage with it and providing additional tools to improve their Pegon reading and writing skills.

A recommendation from this study is to integrate PEGON Madura further-based learning into the religious education curriculum in madrasahs, not only in Madura but also in other regions with local wisdom related to religious texts. Additionally, the development of digital learning media based on PEGON Madura should be a priority to enhance students' accessibility. Finally, further research is needed to assess the implementation of PEGON-based learning in other madrasahs and to identify potential developments for relevant learning technologies.

Thus, the findings of this study make an important contribution to the development of culture-based curricula in religious education and strengthen religious literacy relevant to students' social and cultural lives, ultimately improving the quality of religious education in Indonesia.

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