



DEVELOPING AN E-LEARNING PLATFORM FOR ISLAMIC EDUCATION THAT INCORPORATES THE PRINCIPLES OF RELIGIOUS MODERATION WITHIN SCHOOL SETTINGS

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Abstract

The establishment of online Islamic religious e-learning with a focus on religious moderation in educational institutions is an endeavor aimed at broadening the availability of well-rounded and balanced Islamic religious education through digital learning platforms. This research aimed to create an e-learning system that specifically emphasizes the principles of religious moderation within schools. The research adopted a developmental approach (R&D), by utilizing the ADDIE model (Analysis, Design, Development, Implementation, and Evaluation). After conducting an analysis, the e-learning system was designed and developed using cutting-edge technology that enables active student interaction and engagement. Subsequently, the e-learning system was introduced as a pilot project in the school setting. Students and teachers actively participated in utilizing this system to access Islamic religious content that was customized to their individual needs and comprehension level. Throughout the implementation phase, an assessment was conducted to evaluate the effectiveness of the e-learning system in enhancing comprehension of the Islamic faith and fostering a moderate religious mindset. The findings of this research demonstrated a significant demand for Islamic religious education focused on religious moderation. There was a pressing need for the development of efficient learning tools to facilitate successful comprehension of Islamic Studies materials, particularly among junior high school students. This conclusion is supported by the analysis of data using the Wilcoxon test, which

yielded a t-value of -4.878 and a p-value of 0.00, indicating statistical significance ($p < 0.05$).

Keywords: *E-Learning, Islamic Religious Education, Religious Moderation, Knowledge*

1. Introduction

Indonesia holds a significant position in the realm of Islamic studies¹ due to its rich local wisdom, making it a prime focal point. The presence of this valuable local knowledge should be embraced by intellectuals, scholars, educators, and researchers, as it contributes to the realization of Islam's purpose as a source of blessings for the entire world (*Islam Rahmatan lil 'alamiin*)². In addition to its status as a hub for Islamic studies, Indonesia frequently experiences social conflicts. While these conflicts may not be as protracted as those in the Middle East, they persist in great numbers within Indonesia. Particularly when intertwined with religious matters, conflicts pertaining to religion have remained a prominent issue throughout Indonesia's history since gaining independence. In the preface of the book on religious moderation, Lukman Hakim Syaifuddin highlighted the potential impact of conflicts rooted in religious differences. He emphasized that such conflicts can arise not only between different religious groups but also within the same religion, among different sects or denominations. He further pointed out that these conflicts often stem from issues related to religious beliefs, with individuals justifying their own perspectives by criticizing the interpretations or understandings of others. Each party claims to possess the ultimate truth, but the consequence is that they isolate themselves, rejecting alternative viewpoints and remaining closed off to the religious ideas of others³. Hence, addressing this societal conflict requires concerted efforts at all levels of society to collectively emphasize the significance of unity among individuals, particularly the promotion of religious harmony within the context of religious moderation. It is crucial to diligently work towards this goal.

Indonesia's primary objective at present is promoting religious moderation, which is evident in the three fundamental approaches developed by the government. Firstly, it involves spreading ideas, knowledge, and information about religious moderation to all segments of society. Secondly, it entails implementing policies within institutional bodies to incorporate religious moderation into mandatory programs and guidelines. Lastly, it involves integrating the principles of religious moderation into the 2020-2024 National Medium-Term Development Plan (RPJMN)⁴. The implementation of these three aspects is already underway and has been reinforced through numerous discussions, leading to the soft launch of religious moderation facilitated by the Indonesian Ministry of Religion and the Minister of Technology. This initiative aims to strengthen the role of agents promoting religious moderation⁵.

¹ Zainal Abidin, "Islamic Studies Dalam Konteks Global Dan Perkembangannya Di Indonesia," *AKADEMIKA* 20, no. 01 (Januari-Juni) (2015).

² Abudinata, *Metodologi Studi Islam* (Jakarta: Rajawali Press, 2014).

³ Kementerian Agama RI, *Moderasi Beragama* (Jakarta: Badan Litbang dan Diklat Kementerian Agama RI, 2019).

⁴ Kementerian Agama RI.

⁵ M. Arif Efendi, "Ini Langkah-Langkah Kemenag Dalam Penguatan Moderasi Beragama," *Moderasi Beragama* (Jakarta, 2021).

To achieve a secure and harmonious Indonesia that upholds religious moderation, an additional measure involves enhancing the promotion of religious moderation within the educational process⁶. This approach proves highly effective when imparted to students from a young age. As the current generation of the nation, it is essential for them to develop a balanced intellectual understanding alongside positive values like religious moderation. This equips them with the ability to adapt, acquire knowledge, and become advocates for strengthening religious moderation throughout Indonesia. The cultivation of religious moderation, particularly in the context of Islamic moderation among children, holds immense significance in today's education. It serves as a key element in freeing individuals from extremist and narrow-minded interpretations. The current concern revolves around the extent to which schools and educational institutions are effectively fostering religious moderation among their students. Are there specific educational resources designed to promote religious moderation in children? In addressing these queries, the authors aim to propose a contemporary learning approach that imparts religious moderation to children, utilizing STEM-based learning applications that encompass Science, Technology, Engineering, and Mathematics. The adaptability of the STEM approach allows it to be applied in a range of educational contexts, as seen through its widespread acceptance and implementation in various institutions globally, albeit in different formats and approaches⁷. Given the intriguing matter of religious moderation in Indonesia, there is a need to incorporate STEM into the educational process to foster comprehension and knowledge of this concept.

During the era of the industrial revolution, the changing nature of education requires educators to improve their proficiency in educational technology⁸ in order to meet the demands of the contemporary educational environment⁹. As we are aware, internet-based media has become the dominant form of media consumption, providing a wide range of information to the younger generation¹⁰. This trend also opens the gateway for exclusive and extremist ideologies to infiltrate through this medium. Consequently, there is a pressing need for innovative learning approaches to facilitate easy and effective education, and this is where e-learning comes into play. E-learning, also referred to as internet-based learning, utilizes internet technology to distribute learning materials, allowing students to access them conveniently from anywhere and at any time¹¹. According to The ILRT of Bristol University, e-learning is defined as the

⁶ Herlinawati Herlinawati, "The Integration of Religious Moderation Values in Islamic Religious Education Learning at Public Universities (Efforts and Constraints in the Implementation of Anti-Radicalism Education)," *SYAMIL: Jurnal Pendidikan Agama Islam (Journal of Islamic Education)* 8, no. 2 (December 25, 2020): 157–77, <https://doi.org/10.21093/sy.v8i2.2643>.

⁷ Sukanya Sutaphan and Chokchai Yuenyong, "Enhancing Grade Eight Students' Creative Thinking in the Water Stem Education Learning Unit," *Jurnal Cakrawala Pendidikan* 42, no. 1 (January 31, 2023): 120–35, <https://doi.org/10.21831/cp.v42i1.36621>.

⁸ Afidah Afidah, Miftahuddin Miftahuddin, and Taufiqur Rohman, "Development of Learning Module Reading Al-Qur'an Writing in Basic State School Rogomulyo 02 Semarang," *SYAMIL: Jurnal Pendidikan Agama Islam (Journal of Islamic Education)* 8, no. 2 (November 29, 2020): 99–117, <https://doi.org/10.21093/sy.v8i2.2257>.

⁹ Askar Garad, Abdullah M. Al-Ansi, and Ika Nurul Qamari, "The Role Of E-Learning Infrastructure And Cognitive Competence In Distance Learning Effectiveness During The Covid-19 Pandemic," *Jurnal Cakrawala Pendidikan* 40, no. 1 (February 15, 2021): 81–91, <https://doi.org/10.21831/cp.v40i1.33474>.

¹⁰ Saeful Anam and Arina Almasal Firdaus, "Penggunaan Learning Resources Dalam Pembelajaran Agama Islam," *JALIE: Journal of Applied Linguistics and Islamic Education* 04 (2019): 53–70.

¹¹ M. J. Rosenberg, *E-Learning: Strategies for Delivering Knowledge in the Digital Age*. (New York: Mc Graw-Hill, 2001).

utilization of electronic technology to enhance teaching, learning, and assessment processes. E-learning is considered a component of distance learning, while online learning is a subset of the broader e-learning domain¹². E-learning can be described using different terms, such as computer-based learning, web-based learning, or virtual classrooms¹³. On the other hand, online learning is a type of technology-driven education that utilizes internet, intranet, and extranet resources. Several research findings, such as the study conducted by Huda et al., highlight the positive impact of online learning resources on enhancing student performance and achievement¹⁴. Maryani (2013) found that e-learning has been shown to enhance the learning experience for both lecturers and students¹⁵. Based on the findings of Ngabekti, Prasetyo, Hardianti, and Teampangpong's (2019) research, it can be concluded that the STEM mobile ecosystem learning package exhibits strong validity and readability, while also proving to be effective in enhancing students' scientific and technological literacy¹⁶. In line with Budiaman's (2010) findings, the utilization of the internet as a learning tool tends to enhance students' motivation to learn. Similarly, Bellefeuille, Martin, and Buck (2005) suggested that technagogy, which merges technology and pedagogic concepts, fosters an interactive and productive connection between students, as well as between students and digital technology. This integration facilitates effective teaching practices¹⁷. Munir (2009) proposed that the emergence of technology-driven learning and information paved the way for the development of E-learning¹⁸.

The integration of online learning platforms facilitates the effective delivery of Islamic Religious Education (PAI) content that promotes Islamic moderation. This approach combines various reading materials and contextualizes them within real-life situations and scientific concepts, such as Science, Technology, Engineering, and Mathematics (STEM). Integrated learning of Islamic moderation can be facilitated through websites and e-learning applications, allowing for an applied approach to teaching Islamic Religious Education that aligns with STEM principles. This approach significantly enhances students' understanding and broadens their perspectives on exploring Islamic moderation.

3. Research Method

The research on integrating religious moderation into PAI (Islamic Education) learning through a STEM-based approach is conducted using the ADDIE model, which

¹² T. A Urdan and C. C. Weggen, "Corporate E-Learning: Exploring a New Frontier.," 2000, http://www.spectrainteractive.com/pdfs/CorporateELearningHam_recht.pdf.

¹³ Mutiara Ayu, "Online Learning: Leading E-Learning at Higher Education," *Arab World English Journal (AWEJ) Special Issue on CALL Number 4* (2018).

¹⁴ M Huda et al., "Big Data Emerging Technology: Insights into Innovative Environment for Online Learning Resources.," *International Journal of Emerging Technologies in Learning (IJET)* 13, no. 1 (2018): 23-36.

¹⁵ Y Maryani, "Aplikasi E-Learning Sebagai Model Pembelajaran Berbasis Teknologi Informasi Di Jurusan Kesehatan Gigi Poltekkes Kemenkes Pontianak.," *Jurnal Vokasi* 9, no. 1 (2013): 27-39.

¹⁶ S Ngabekti et al., "The Development of STEM Mobile Learning Package Ecosystem.," *Jurnal Pendidikan IPA Indonesia* 8, no. 1 (2019): 81-88.

¹⁷ G Bellefeuille, R.R Martin, and M.P. Buck, "From Pedagogy to Technagogy in Social Work Education: A Constructivist Approach to Instructional Design in an Online, Competency-Based Child Welfare Practice Course.," 2005.

¹⁸ Munir, *Pembelajaran Jarak Jauh Berbasis Teknologi Informasi Dan Komunikasi*. (Bandung: Alfabeta, 2009).

follows the stages of Analysis, Design, Development, Implementation, and Evaluation¹⁹. The research process commenced with preliminary stages, which involved analyzing the requirements for developing learning applications. This encompassed performance analysis, student analysis, examination of facts, principles, and learning procedures, as well as an analysis of the learning objectives²⁰. The subsequent phase involves designing through the compilation of teaching materials, development of learning scenarios, selection of teaching material competencies, initial planning of instructional materials, and creation of learning evaluation tools²¹. The third phase, development, involves creating and refining the learning material to be utilized. This developmental process encompasses two stages: the initial creation of the learning applications and subsequent modifications made to enhance their effectiveness²². The fourth stage involves implementing the developed learning applications in real classroom situations. Subsequently, the fifth stage entails conducting evaluations to enhance the input received during the implementation process.

The participants in this research consisted of students from SMP Daruttaqwa Gresik Junior High School and SMP Mambaus Sholihin 6 Tuban. A purposive sampling method was used to select a sample of 15 students from each school, comprising six students with high learning achievement, six students with moderate learning achievement, and three students with low achievement from the seventh grade. Figure 1 illustrates the conceptual framework for the integration of STEM-based religious moderation into Islamic Religious Education (PAI) learning.

¹⁹ Hamonangan Tambunan, "Pengembangan Pembelajaran Berbasis Website Dalam Matakuliah Pengaturan Mesin Listrik," *Jurnal Cakrawala Pendidikan* 5, no. 1 (May 6, 2013), <https://doi.org/10.21831/cp.v5i1.1260>.

²⁰ Rahmat Arofah Hari Cahyadi, "Pengembangan Bahan Ajar Berbasis Addie Model," *Halaqa: Islamic Education Journal* 3, no. 1 (June 5, 2019): 35–42, <https://doi.org/10.21070/halaqa.v3i1.2124>.

²¹ Punaji Setyosari, *Metode Penelitian Pendidikan Dan Pengembangan*, Keempat (Jakarta: Kencana, 2016).

²² Cahyadi, "Pengembangan Bahan Ajar Berbasis Addie Model."

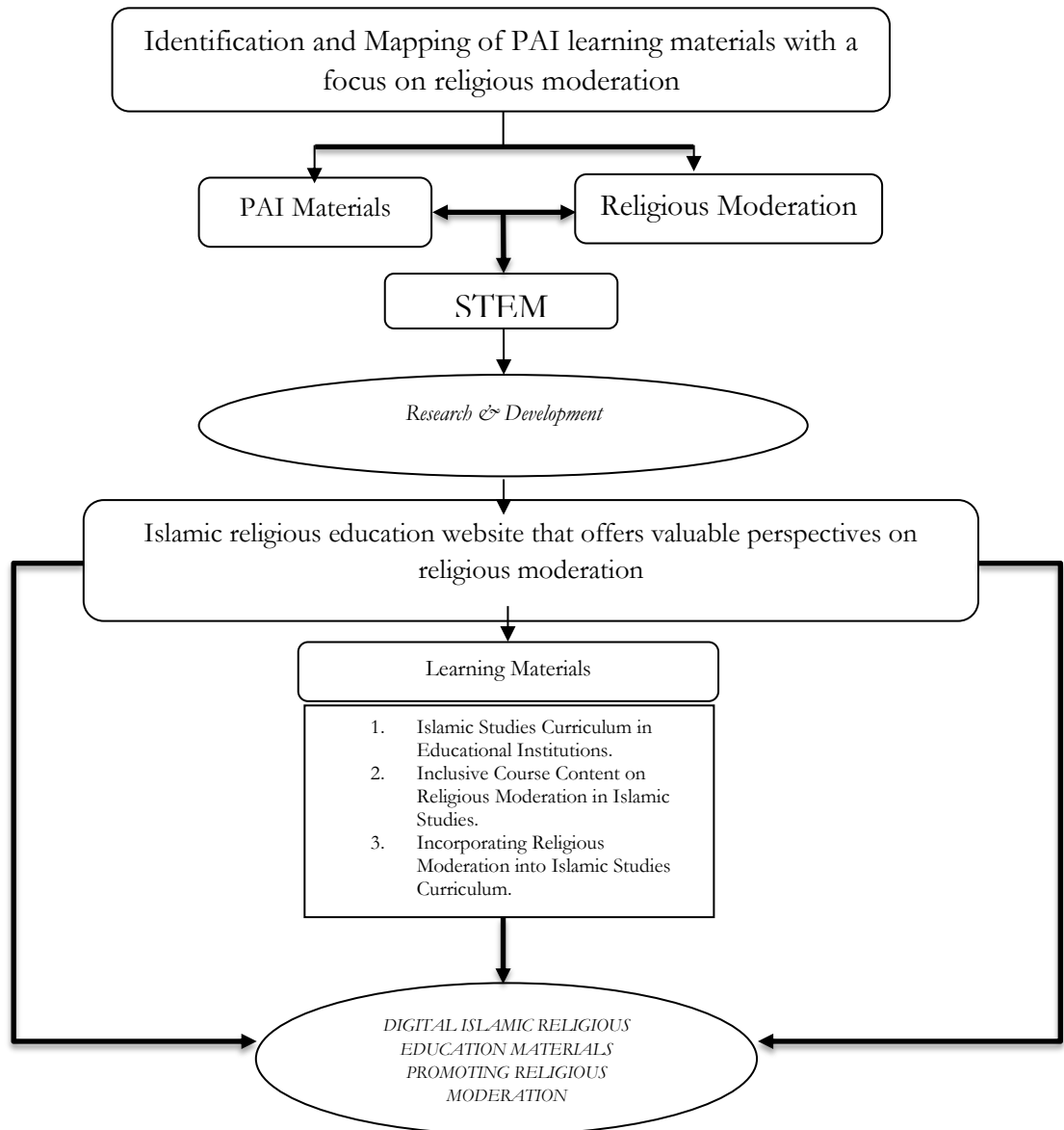


Figure 1: The Conceptual Framework for Developing an Islamic Religious Education App Incorporating STEM-based Religious Moderation Insights

One of the correlations between Islamic religious content and the concept of religious moderation in Grade VII is presented in Table 1. This material was derived from Grade VII textbooks and Islamic moderation resources developed by the Ministry of Religion of the Republic of Indonesia.

Table 1: Mapping of Islamic Religious Materials with the Perspective of Religious Moderation

CHAPTER	Learning Materials	No. of Basic Competency	Value of Religious Moderation
1	Deepening our connection with Allah (swt), Whose Name is remarkably exquisite	1.3, 2.3, 3.3, 4.3	Justice (<i>I'tidal</i>), moderation (<i>tawassuth</i>).

2	Living peacefully through Honesty, Trustworthiness, and Steadfastness	1.5, 2.5, 3.5, 4.5	Justice (<i>I'tidal</i>); leadership (<i>qudwah</i>).
3	The Comfort of Living a Pure Life	1.7, 2.7, 3.7, 4.7	Tolerance (<i>tasamuh</i>).
4	The Splendor of Unity through Congregation	1.8, 2.8, 3.8, 4.8	Tolerance (<i>tasamuh</i>); leadership (<i>qudwah</i>).
5	Welcome, Prophet Muhammad saw.	1.11, 2.11, 3.11, 4.11	Tolerance (<i>tasamuh</i>); leadership (<i>qudwah</i>); Affection towards the homeland (<i>muwathanab</i>); non-violence (<i>al-la 'unf</i>).
6	Through the acquisition of knowledge, all tasks become more manageable.	1.1, 2.1, 3.1, 4.1.1, 4.1.2, 4.1.3	leadership (<i>qudwah</i>). <i>Al-Isblab</i> (Improvement)
7	Aspiring to emulate the obedience of Allah's angels	1.4, 2.4, 3.4, 4.4	<i>Al-La 'Unf</i> - (Non-violence) Justice (<i>I'tidal</i>);
8	Empathy is effortless, respect is lovely	1.6, 2.6, 3.6, 4.6	Moderation (<i>tawassuth</i>); leadership (<i>qudwah</i>); tolerance (<i>tasamuh</i>).
9	Cultivating a sense of unity on the awaited day	1.9, 2.9, 3.9, 4.9	Tolerance (<i>tasamuh</i>); leadership (<i>qudwah</i>).
10	Islam offers convenience through collective worship and congregational prayer	1.10, 2.10, 3.10, 4.10	Tolerance (<i>tasamuh</i>); leadership (<i>qudwah</i>).
11	The Migration to Madinah: An Inspiring Story	1.12, 2.12, 3.12, 4.12	Tolerance (<i>tasamuh</i>); leadership (<i>qudwah</i>); cultural acceptance (<i>I'tiraf al-'urf</i>).
12	Al-Khulaf [±] u Ar-R [±] syidun: The one who continues the legacy of Prophet Muhammad's endeavor.	1.13, 2.13, 3.13, 4.13	Tolerance (<i>tasamuh</i>); leadership (<i>qudwah</i>).
13	Peacefulness prevails in life through the virtues of sincerity, patience, and forgiveness	1.2, 2.2, 3.2, 4.2.1, 4.2.2, 4.2.3	Moderation (<i>tawassuth</i>); leadership (<i>qudwah</i>); tolerance (<i>tasamuh</i>).

Considering the theoretical framework and the mapping of Islamic Religion content presented earlier, it becomes essential to establish an indicator that highlights the importance of developing a STEM-based Islamic Religion learning application with a focus on religious moderation. This necessity arises from the findings of preliminary research observations conducted among teachers and students. Additionally, to evaluate the alignment of Islamic religious content with the principles of religious moderation, an expert-oriented validation tool is required. This instrument will assess and provide feedback on Islamic religious content, specifically pertaining to religious moderation, targeting seventh-grade students in junior high

school. For a detailed breakdown of the categories, please refer to Tables 2 and 3 provided below:

Table 2: Indicators for Developing Islamic Religious Education Learning Applications, Emphasizing Religious Moderation with the STEM Approach

No	Indicators	Average n=(40)	Description
1	The learning model in the digital age:		Highly Essential
2	The strategy of PAI learning with religious moderation insights using the STEM approach		Essential
3	The implementation of PAI learning with insights into religious moderation: Extremely important		Highly Essential
4	The practicality of applications in daily life		Highly Essential
	Average		Highly Essential

Table 3: Instrument Validation of Islamic Religious Education Learning Materials Focusing on Religious Moderation

No	Aspects	Expert Evaluation			Average
		1	2	3	
A Lesson Plans (RPP)					
1	Suitability of the final expected competencies in the lesson plans				
2	Appropriateness of the instructional materials in the lesson plans				
3	Relevance of the learning activities in the lesson plans				
4	Adequacy of the time allocation in the lesson plans				
5	Alignment of the learning experiences with the objectives in the lesson plans				
6	Appropriateness of the assessment criteria and indicators in the lesson plans				
B Integration of Religious Moderation Values					

7	Consistency of integrating religious moderation values with the characteristics of Islamic religious education (PAI) learning
8	Alignment of the integration of religious moderation values with the Development and Implementation of Lesson Plans (RPP)
C PAI Learning Materials	
9	Relevance of PAI learning materials in promoting an understanding of religious moderation based on classroom learning needs
10	Relevance of religious moderation-oriented Islamic religious education learning materials to meet needs beyond the classroom
11	Clarity and comprehensibility of the language used in PAI learning materials focusing on religious moderation
12	The suitability of the instructional approach in Islamic religious education material focusing on religious moderation
13	Alignment of religious moderation values with the content of PAI materials
D Evaluation	
14	Alignment of the questions with PAI learning materials focusing on religious moderation
15	Appropriateness of the time allocated for working on questions related to PAI learning materials focusing on religious moderation

4. Finding and Discussion

Findings

The preliminary study in this research yielded three main findings, which are as follows: (1) the real condition of Islamic Religious Education in schools, (2) analysis of the educational requirements for Islamic Religious Education with a focus on religious moderation, and (3) a proposed implementation plan for Islamic Religious Education incorporating religious moderation through a STEM (Science, Technology, Engineering, and Mathematics) approach. Employing the ADDIE (Analysis, Design, Development, Implementation, and Evaluation) stages, the initial study discovered that the current state of Islamic Religious Education in schools lacked the use of applications and lacked insight into religious moderation. Furthermore, the teaching of Islamic Religious Education also lacked a clear framework for religious moderation and did not possess appropriate evaluation methods. Therefore, there is an urgent need to incorporate religious moderation into the teaching of Islamic Religious Education, as indicated by an

average Likert scale score of 3.54 on a scale of 1-5, signifying a moderate level of need. Furthermore, questionnaires were also used to identify the requirements for learning models in the digital age, specifically focusing on the utilization of learning applications for Islamic religious content. This research aimed to assess the level of necessity for these models, using a Likert scale ranging from 1 to 5. The findings revealed a high demand for learning models in the digital era, with a score of 3.61 (indicating a strong need). Additionally, the survey assessed the effectiveness of the learning strategy for Islamic Education (PAI) with an emphasis on religious moderation, yielding a score of 3.41 (indicating a moderate need). Moreover, there was a significant need for the practical implementation of applications in daily life, combining Islamic learning with a focus on religious moderation. This received an average score of 3.53 (indicating a strong need), based on the Likert scale. The respondents for this survey included 40 PAI teachers from MGMP PAI across Gresik Regency. The results of the assessment for the demand of an Islamic religious learning application, incorporating STEM-based religious moderation, are illustrated in the figure below.

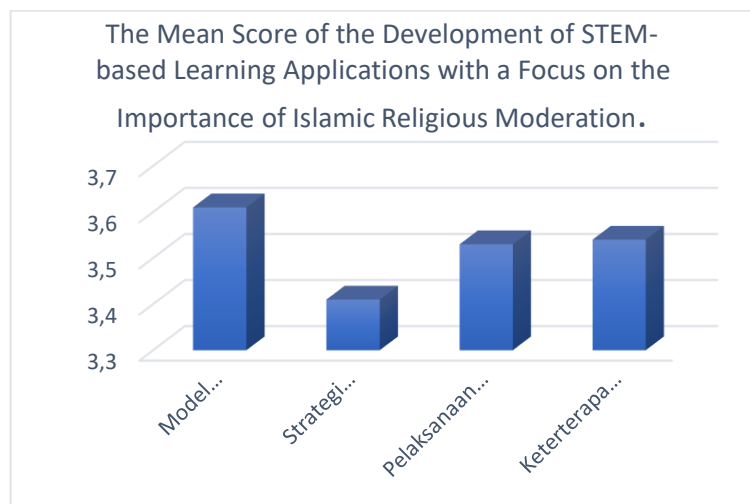


Figure 2. Histogram of Needs for Development of Islamic Religious Education Learning Applications with STEM-based Religious Moderation Insight

The outcomes of engaging with the instructional content “Deepening our connection with Allah (swt), Whose Name is remarkably exquisite” via the Islamic Moderation e-Learning platform during a restricted trial period are presented below;

Table 4. The effectiveness of the Islamic Moderation e-Learning application in a Restricted Trial

No.	Name	No. of Attendance List	Pre-test	Post-test	Average
1	AS	4	75	95	85
2	EL	6	50	75	62.5
3	SH	23	60	85	72.5
4	HA	9	50	80	65

5	KS	12	75	90	82.5
6	RW	22	50	75	62.5
7	AN	1	70	95	82.5
8	AP	3	60	95	77.5
9	PA	19	75	95	85
10	DS	5	75	85	80
11	MN	16	50	80	65
12	WP	28	75	90	82.5
13	NA	18	75	85	80
14	YF	29	75	90	82.5
15	RF	21	50	80	65
16	PH	20	70	95	82.5
17	MN	15	50	85	67.5
18	KB	12	70	90	80
19	IM	10	50	85	67.5
20	MI	14	50	95	72.5
21	WL	27	50	75	62.5
22	TD	26	50	80	65
23	FP	7	75	95	85
24	MU	17	75	85	80
25	MC	13	75	90	82.5
26	AN	2	50	85	67.5
27	SN	25	50	85	67.5
28	KA	11	50	85	67.5
29	SI	24	50	85	67.5
30	FS	8	50	85	67.5
	Rata-rata		61	86.5	73.75

Prior to assessing the efficacy of e-Learning for Islamic Moderation, preliminary tests are conducted, including: 1) a descriptive test, and 2) a standard test. The outcomes of the descriptive test are presented in Table 4, while Figure 3 below depicts the histogram illustrating the pre-post material of Islamic Moderation e-Learning.

Table 5. Descriptive Data of Pre-test and Post-test

	Pre-test	Post-test
Valid	31	31
Missing	0	0
Mean	61.0000	86.5000
Median	60.0000	85.0000
Mode	50.00	85.00
Std. Deviation	11.57584	6.21155
Variance	134.000	38.583
Minimum	50.00	75.00
Maximum	75.00	95.00
Sum	1891.00	2681.50

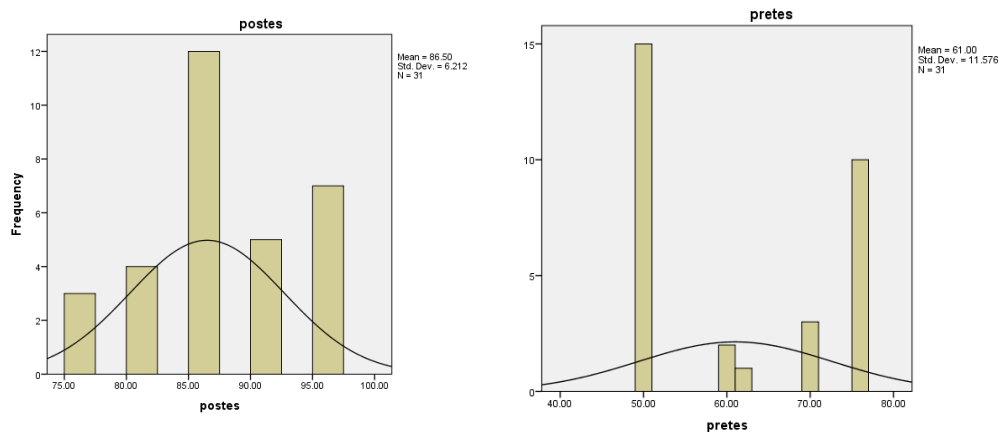


Figure 3. Pre-post histogram of Islamic Moderation e-Learning material

Table 4 presents the findings that the research respondents consisted of 30 students. The descriptive data for the pretest are as follows: mean=61.00, median=60.00, mode=50.00, minimum=50.00, and maximum=75.00. Meanwhile, the descriptive data for the posttest are as follows: mean=86.50, median=85.00, mode=85.00, minimum=75.00, and maximum=95.00. Additionally, the histogram depicting the descriptive data for the pretest is shown in Figure 3. Prior to conducting the t-test on the pretest and posttest data, a normality test was performed on the data, yielding the results presented in Table 6. Furthermore, the Q-Q plot for the posttest data is illustrated in Figure 4.

Table 6. Data normality test

	Shapiro-Wilk		
	Statistic	df	Sig.
Pre-test	.726	31	.000
Post-test	.901	31	.008

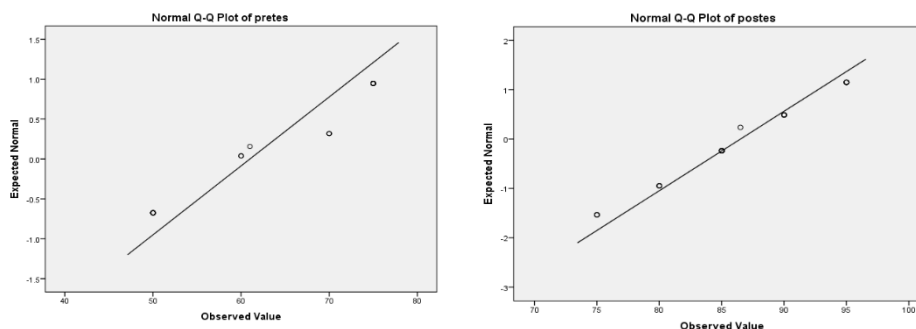


Figure 4. Q-Q Normality plots

After conducting a data normality test using SPSS Shapiro-Wilk, it was found that the pre-test had a significance value of 0.000 ($p > 0.05$), while the post-test had a significance value of 0.08 ($p > 0.05$). These findings indicate that both the pre-test and post-test data did not follow a normal distribution. Therefore, the effectiveness test was conducted using the Wilcoxon test. The results of the Wilcoxon test can be seen in Table 7.

Table 7. Wilcoxon test

	Post-test – Pre-test
Z	-4.878
Asymp. Sig. (2-tailed)	.000

According to the Wilcoxon test, the t count result is -4.878, with a p-value of 0.00, which is less than 0.05. As a result, H_a (alternative hypothesis) is accepted, and H_o (null hypothesis) is rejected. This implies that the implementation of Islamic education learning applications, incorporating religious moderation, effectively enhances students' learning comprehension in 2022.

Discussion

Based on actual circumstances, the research findings suggest that there are three areas that require further investigation. These three areas are as follows: 1) the teaching of Islamic Religious Education with a focus on religious moderation has not incorporated the use of applications; 2) learning materials for Islamic Religious Education with a focus on religious moderation have not been created; 3) there has been no evaluation of the teaching of Islamic Religious Education with a focus on religious moderation. Meanwhile, the results of the analysis on the requirements for the development of learning applications in Islamic

religious education, specifically those emphasizing religious moderation, are as follows: 1) the average requirement for digital-era learning models was 3.61 (highly essential); 2) the average requirement for learning strategies promoting religious moderation is 3.41 (essential); 3) the average requirement for the implementation of religious moderation-oriented Islamic Religious Education teaching is 3.54 (highly essential). The average requirement for the implementation of application-based teaching in social religion is 3.53 (highly essential). After preparing the materials and developing learning applications focused on Islamic religious moderation, a focus group discussion (FGD) was conducted involving subject matter experts, media experts, and IT experts. The input received during the FGD regarding the draft materials and applications is presented in the table below;

Source Person	Suggestions / Feedback
Material Expert	a) The desired educational outcomes involve the integration of religious learning materials with values of religious moderation, encompassing knowledge, values, attitudes, and student skills;
	b) It is crucial to guarantee and adjust the format of instruction to align with the intended advancements in Islamic religious education, specifically emphasizing religious moderation;
	c) In the initial stage: the concepts have been well-established by referring to relevant literature, books, and journals. It is recommended to consider recent references from the past three years, particularly those related to e-learning, online learning, and integrated learning strategies;
	d) The learning materials for Islamic Religious Education with a perspective on religious moderation should be systematic, comprehensive, and well-integrated. They should also utilize language that is easy to understand. Furthermore, the materials should be reinforced with references at the conceptual level. It is important to verify the appropriateness of the bibliography included at the end of the material;
	e) Findings from the Initial Investigation: It is evident that the implementation of PAI learning from the standpoint of Religious Moderation is undeniably significant, thus making it suitable for further development;
Media Expert	a) The selection of the theme “Deepening our connection with Allah (swt), Whose Name is remarkably exquisite” as a means of internalizing the concept of <i>asma’ul husna</i> (the beautiful names of Allah) in daily life is suitable for the research topic;
	b) In the realm of human existence, diverse perspectives and principles of religious moderation exist, which collectively serve as a guiding framework for daily life;
	c) The research on PAI learning needs to introduce innovation by incorporating learning applications that integrate the STEM approach. This integration will enable the exploration of various challenges and interests encountered by individuals;

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- d) Further research is needed to specifically delve into the content of diverse moderation values. For example, values such as love for one's homeland or non-violence, both of which can contribute to peace if implemented in daily life;

 - e) It is expected that future research will delve into a more detailed and comprehensive exploration of the legitimacy basis;

 - f) Well done on conducting this research and highlighting the significance of Islamic moderation, which deserves recognition from the broader community.
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The assessment of three experts in PAI learning materials yielded the following results: a) Lesson Plan (RPP): 4.72; b) Mapping the value of Islamic moderation: 4.84; c) PAI Learning Materials: 4.67; d) Evaluation: 5.00. Additionally, the assessment conducted by the IT expert produced the following results: a) Rationality of Islamic Religious Education learning applications with a perspective on religious moderation using the STEM approach: 4.84; b) Characteristics of PAI application with a perspective on religious moderation: 4.72; c) LMS Learning PAI with a perspective on religious moderation: 4.92; d) Website Dashboard: 4.75; e) User-Friendly: 4.50; f) User Interface: 4.67; g) Practical Benefits: 4.78.

The trial conducted to develop an Islamic religious moderation-oriented learning application with the aim of enhancing the understanding of seventh-grade students at SMP Daruttaqwa Gresik in 2022 yielded the following three findings: (1) Individual trials took place on November 30, 2022, at SMP Daruttaqwa Gresik, involving a total of six participants. The assessment results, depicted in figures 4 to 27, were categorized as "Good."; (2) Group trials were conducted on December 3, 2022, at SMP Daruttaqwa Gresik, with 12 participants. The assessment of the trial model, depicted in figures 28 to 51, fell under the "Very Good" category; and (3) Limited trials were carried out on December 8, 2022, at SMP Daruttaqwa Gresik, involving 31 participants. The assessment results, shown in figures 52 to 76, were categorized as "Good."

In order to assess the effectiveness of learning applications that focus on Islamic religious moderation using the STEM approach, a test was conducted using the "One-Group Pretest-Posttest Design" research design. The paired t-test revealed a t-value of -4.786, with a p-value of 0.00, which is less than 0.05. Therefore, the alternative hypothesis (H_a) was accepted, while the null hypothesis (H_o) was rejected. This indicates that the development of learning applications emphasizing Islamic religious moderation, coupled with an effective STEM approach, can enhance the understanding of students at SMP Daruttaqwa Gresik in the year 2022.

5. Conclusion

The research findings indicated that there was a significant need for the development of Islamic religious moderation learning applications for teachers in junior high schools. The need assessment revealed that: a) the demand for a digital era learning model received a high score of 3.61, indicating a strong need for this category; b) the PAI (Islamic Religious Education) learning strategy with religious moderation insight was rated at 3.41, indicating a moderate level of need; c) the implementation of PAI learning with a focus on religious moderation received a score of 3.54, suggesting a high level of need. The practicality of the applications in daily life received a score of 3.53, indicating a significant need. Based on these findings, the research proposed the

development of Islamic religious moderation-oriented learning applications for teachers in junior high schools. The proposed application takes the form of a website-based platform designed for online learning, with the main access being the open course. The website can be accessed at the following link: <https://moderationislam.com/>. Furthermore, the effectiveness of the developed learning applications was assessed by measuring the students' understanding of PAI material with a focus on religious moderation in junior high schools. The statistical analysis, using the Wilcoxon test, resulted in a t-value of -4.878, with $p = 0.00 < 0.05$. Therefore, the research concludes that the Islamic religious moderation learning application is effective in improving students' understanding of learning at the junior high school level in 2022, as evidenced by the acceptance of the alternative hypothesis (H_a) and rejection of the null hypothesis (H_0).

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