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Fostering Pre-service Teachers' Empathy through AI-Enhanced MoralQ Application: An Experimental Study

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ABSTRACT

This study examines the effectiveness of the AI-enhanced MoralQ app in improving empathy and its impacts. Using an experimental approach, 138 pre-service teachers from five Indonesian universities participated in an intervention using the MoralQ app. Data were gathered through an essay test, which the app's AI evaluation algorithm assessed and human experts cross-checked. Paired-sample t-tests and Cohen's d analysis showed an average empathy score increase of approximately 5.44 points, with an effect size of 0.76. These results suggest that using the MoralQ app significantly boosts pre-service teachers' moral awareness and empathy scores. Therefore, integrating the MoralQ app into pre-service teacher training programs is highly recommended for fostering empathy.

Keywords: artificial intelligence, chatbot AI, empathy, experimental study, mobile application, MoralQ application, pre-service teachers

INTRODUCTION

In Indonesia, teachers' personal competence is a crucial aspect of education, as specified in the Teacher and Lecturer Law. This competence highlights the importance of moral integrity and social-emotional skills, positioning teachers as role models for students. Teachers with strong personal competence foster a welcoming, supportive learning environment. This environment helps students manage stress and anxiety, supporting their academic achievement. This supportive setting also contributes to character development, enabling students to excel in various tasks, which ultimately prepares them for success in their future careers (Padmakumari et al., 2025; Robingatin et al., 2025; Smidt, 2015; Yu et al., 2025).

Personality competence directly impacts students' cognitive growth. Teachers skilled in personality competence interact effectively with students, manage classrooms efficiently, and foster strong personal relationships (Usman et al., 2024; Zaqiah et al., 2024). This indirectly encourages students to learn and helps them accept the material presented. A teacher with a strong personality also helps guide students toward their full potential, aligning with students' openness in seeking advice on academic and non-academic challenges that affect their learning (Faisal et al., 2021; Mulyana et al., 2023).

In Indonesia, teachers' personal competencies are developing slowly. A major challenge is the limited availability of tools for teachers to improve their skills (Hasbiyallah et al., 2023). As students face more issues at school and in daily life, teachers confront increasingly complex theoretical dilemmas. The lack of real-time learning resources that evolve with current trends hampers their ability to engage effectively with students, leading to a gradual drop in motivation and dedication (Loeneto et al., 2022). These resource shortages result in weaker personal competencies among teachers, affecting their professional performance (Ingarianti et al., 2023).

Teacher personality competence includes empathy, which is the ability to regulate emotions around students. This skill helps teachers manage aggressive behaviour, improve relationships, and encourage positive social interactions (Aldrup et al., 2022; Sun et al., 2025). Empathy allows teachers to understand students' motivations and emotions, fostering stronger connections. However, data shows that Indonesian teachers often struggle to grasp their students' emotional challenges (Sumani & Arifin, 2018; Susanto et al., 2019). Many experience stress, anxiety, or indifference toward current conditions. This difficulty is even greater for pre-service teachers, who typically lack experience and may be overlooked by students or find it hard to respond appropriately due to the absence of skilled mentors who can teach empathy (Andriyati et al., 2026).

To address these challenges, teachers and pre-service teachers should have consistent access to empathy development resources. In an era of rapid AI advancement, empathy can be continuously enhanced anytime and anywhere (Camargo & Francis, 2025; Gómez-León, 2022; Wahi et al., 2025). AI offers access to current learning materials, including real-world cases, increasing precision. It can also create simulated environments where educators can practice adopting professional, appropriate attitudes. Moreover, AI boosts engagement by enabling access to learning platforms anywhere. It supports the ongoing, swift, accurate, and timely evaluation of empathy, helping educators monitor their empathy growth over time.

LITERATURE REVIEW

Artificial Intelligence and Empathy Assessment in Teacher Education

Pre-service teachers can enhance their personal skills, such as empathy, through social, cognitive, and affective interactions within schools. Social interactions involve verbal communication, cognitive interactions include considering what to say or avoid saying, and affective interactions reflect attitudes that demonstrate empathy. These interactions help students and teachers better understand each other's emotions and prevent conflicts (Schoenfeld-Tacher et al., 2017). Effective emotion management fosters a

comfortable environment for students, colleagues, and the entire school community, both verbally and physically. This trust-building encourages more positive relationships.

Empathy can now be assessed not only by humans but also by AI systems. These systems analyze human-written texts, like essays expressing feelings and thoughts about actions. The tone of writing reveals empathy levels linked to specific emotions. Measures also include how students describe handling situations, show concern through sentence structure, and use moral language. Developers can use these insights to create AI tools that provide automatic, personalized feedback (Sharma et al., 2020).

Using AI to develop human empathy offers significant benefits, especially for pre-service teachers who have limited practical school experience. These teachers often lack familiarity with the diverse challenges related to student misconduct. An AI system can simulate realistic classroom scenarios and recommend appropriate responses. However, such empathetic AI must follow a clear, fair framework that protects all students' rights (Farooqi, 2025). Importantly, pre-service teachers should maintain full control over available response options, allowing them to choose suitable actions as their experience increases.

While AI can promote empathy globally, differing cultural standards pose challenges. Each country has its own definitions of high, moderate, or no empathy, often with regional differences. Developers face the task of minimizing cultural biases in AI systems to avoid ethical issues and ensure consistent recognition of empathy (Hulus, 2026).

AI-enhanced Platform for Empathy Assessment

Using artificial intelligence to evaluate pre-service teachers' personal qualities has sparked significant debate. Critics question AI's reliability, pointing out that it often makes mistakes in complex moral and empathetic judgments because its reasoning has not yet matched human intuition, partly due to reliance on outdated and biased data (Khan, 2026). Meanwhile, advocates argue that AI can sometimes offer more objective assessments, as personal biases like ego, fear, or group pressure less influence it. These discussions position AI mainly as a supportive tool for educators, suggesting actions rather than making final decisions (Ofosu-Asare, 2026).

However, overreliance on AI could impair pre-service teachers' ability to analyze situations critically and develop moral awareness, as these tools may diminish independent thinking and ethical understanding (Abubakar et al., 2025). It can create a false sense of security, leading to hesitation in taking spontaneous actions and increased anxiety about making wrong choices without AI support. This dependency is particularly risky for pre-service teachers who influence student attitudes.

Current AI limitations come from its reliance on human-constructed mathematical data, which is inherently based on human logic across diverse educational contexts (Badr & Charles, 2026). Furthermore, most existing models reflect Western perspectives and lack cultural diversity, which can lead to biased moral representations that differ significantly from those in Eastern and other cultures.

AI-enhanced MoralQ application for Enhancing Pre-service Teachers' Empathy

MoralQ, an AI-enhanced tool designed to boost empathy among teachers and pre-service teachers, was developed by the authors and has undergone multiple tests (Arifin et al., 2024; Arifin & Setiyadi, 2023). Adding artificial intelligence enhances the application's usefulness. Here is a brief overview of this tool:

Figure 1. *MI app*

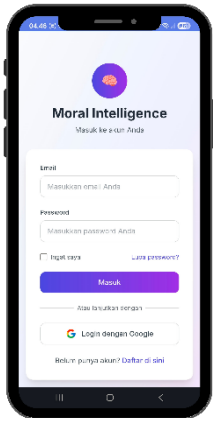

Figure 2. *Login*

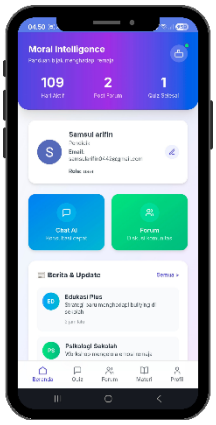

Figure 3. *Dashboard*

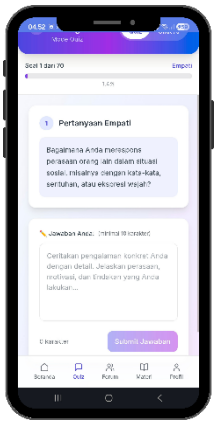

Figure 4. *Test empathy*

Figure 5. *Chat Moral AI*

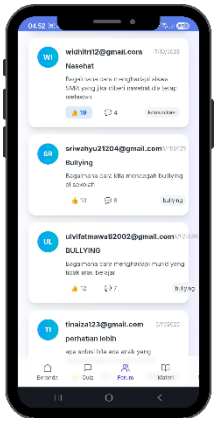

Figure 6. *Discussion forum*

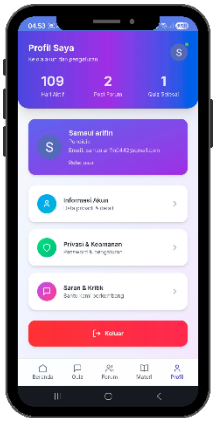

Figure 7. *User profile*

Figure 1 depicts the AI-enhanced MoralQ app installed on a smartphone. Figure 2 illustrates the application's use of single sign-on (SSO), which enhances data security and streamlines security management. Figure 3 features a dashboard displaying the user's learning progress, allowing monitoring of empathy awareness goal achievement. Figure 4 shows that the app includes an empathy-level assessment for students, accessible in real time, consisting of essay responses about their thoughts and actions. AI evaluates these responses, delivering faster, more accurate, and less biased results than traditional questionnaires. Figure 5 depicts a future chat AI that helps teachers and pre-service teachers better understand empathy and related scenarios, and manage them effectively through chat interactions. Figure 6 illustrates a forum where teachers and pre-service teachers can share best practices for addressing student issues while demonstrating empathy. Figure 7 shows the user profile, including app usage data, empathy test results, security policies, and user feedback for app improvement, presented as a questionnaire and essay.

Advantages of the AI-enhanced Application in Teaching Empathy

Pre-service teachers use digital platforms to improve their ethical understanding independently. These advanced tools also enhance pre-service teachers' critical thinking when facing moral dilemmas in schools. By regularly analyzing real-world cases, these intelligent systems foster greater moral sensitivity. Dao Thi Thu et al. (2026) highlight how consistent practice via digital platforms strengthens ethical awareness among pre-service teachers. Ranggana et al. (2026) support weaving technology into teacher training to cultivate more socially aware educators. Roy & Jony (2026) point out that digital systems create

a dynamic space for ethical discussion. Teoh & Tan (2026) show how technology can improve moral decision-making among pre-service teachers.

This innovative approach offers a highly interactive learning environment for all pre-service teachers. Artificial intelligence provides reflective learning through immersive social interaction simulations, allowing teachers to practice empathy without time or space limits. Research confirms that digital independent learning effectively improves ethical understanding (Ahmed et al., 2026). It also highlights technology's key role in helping pre-service teachers regulate their emotions (Fakouri et al., 2026). These immersive experiences encourage daily self-reflection on actions. Digital simulations serve as practical tools for self-evaluation.

Pre-service teachers receive precise, personalized feedback from automated essay analysis. This immediate guidance helps identify specific gaps in their moral reasoning. Such feedback aids pre-service teachers in developing empathetic communication skills for interactions with students (Huang et al., 2025). They can use evaluation results to craft more approachable, character-based teaching strategies. This intelligent support system promotes ongoing character development among aspiring educators.

Hypothesis

This study aims to evaluate two key aspects: (1) the effectiveness of the AI-enhanced MoralQ application in improving pre-service teachers' empathy, and (2) the overall impact of its use. To achieve these objectives, the following hypotheses are proposed:

H1: The AI-enhanced MoralQ application improves empathy scores in pre-service teachers.

H2: The AI-enhanced MoralQ application significantly influences the empathy scores of pre-service teachers.

RESEARCH METHOD

This study used a one-group pre-test and post-test experimental design to assess the MoralQ application's effectiveness. We integrated it into a microteaching course as part of a character education approach. This setup allowed us to observe changes in pre-service teachers' personality skills before their practical teaching in schools. The main goal was to improve the quality of moral guidance future educators provide. We recognize that the lack of a control group poses significant methodological limitations, including threats to internal validity such as maturation and history effects. Over ten weeks, teachers might naturally become more empathetic as they prepare for their internships. The decision to exclude a control group stemmed from curriculum restrictions and ethical considerations, as the university must ensure all pre-service teachers receive equal empathy training before their placements.

Participants and Sampling Technique

The researchers employed purposive sampling to select five partner universities across Indonesia. This intentional choice ensured comprehensive representation of higher education institutions. The selected universities included public and private institutions, religious-based universities, and a teacher professional association. The sample also covered diverse geographical areas, ranging from regencies to provincial capitals, to enrich the research data. Another reason for choosing purposive sampling was its alignment with specific criteria for pre-service teachers. Participants were required to complete a microteaching course before using the MoralQ application, ensuring they had a solid understanding of educational psychology fundamentals. Additionally, they had to prepare for upcoming real-world teaching practice in schools, making sure their theoretical knowledge and mental readiness supported the accuracy of the system's moral dilemma evaluation.

Table 1
Sample reflecting the university cluster and study program

University cluster	Study programs	Location	Number samples	Total samples
State University	Indonesian education	Provincial capital	28	138
Private university	Guidance and counseling	District X	27	
Private university	English education	District Y	29	
Religious-based university	English education	District Z	39	
Teacher professional association-based university	Biology education	City A	15	

Table 1 indicates that the sample included 138 pre-service teachers from five Indonesian universities. These universities exemplify the variety of campuses across Indonesia and represent institutions in districts, cities, and provincial capitals. Table 2 shows the sample distribution: 40 males and 97 females, aged 19 to 23 years (93% of the total).

Table 2
Sociodemographic Characteristics of Participants at Baseline

Baseline characteristic	Full sample	
	N	%
Gender		
Female	97	70.3
Male	41	29.7
Age (years old)		
< 19	0	0
19 to 23	129	93.48
> 23	9	6.52

Instrument

This research used a test as its main tool, comprising essay questions on empathy for pre-service teachers. These questions utilized standardized and validated instruments measuring moral intelligence (Borba, 2001). The scenarios focus on school settings and case dilemmas that pre-service teachers need to resolve. The details of this instrument are outlined below:

Table 3
Items designed to evaluate empathy via essay questions.

Number	Essay questions
1	How would you respond to students' feelings in social situations? Provide concrete examples
2	What actions would you take to show concern for students' needs?
3	How do you identify non-verbal cues from students, such as facial expressions and body language?
4	How do you respond to various facial expressions shown by students? Provide examples
5	What would you do when you see a student under stress? How do you offer comfort or assistance?

6	How do you demonstrate understanding of students' feelings through actions, such as nodding or mimicking expressions?
7	How do you show emotional reactions, such as crying or sad expressions, when observing a stressed student?
8	What actions do you take when observing students being treated unfairly? How do you defend or voice your concerns?
9	How do you discuss or ask questions to gain an understanding of students' perspectives? Provide examples
10	How do you identify and verbalize the feelings experienced by students? What approach

Table 3 indicates that the test was an essay-style format with 10 questions. The test-taker must write at least 40 characters to move on to the next step and complete the task.

Data collection technique

Data were collected over 10 weeks, from October to early December 2025. During this period, participants used the AI-enhanced MoralQ app in real time. The process started with a joint trial to familiarize participants with the personality competence test feature, which assesses pre-service teachers' initial skills. This was followed by a socialization session on using the MoralQ features to increase moral awareness. The questions posed could vary widely, depending on the case at hand. The socialization session ended with feedback shared in the moral and ethics communication forum about using the app. Afterwards, pre-service teachers communicated privately using the AI-enhanced MoralQ app anytime, anywhere. They could also take the personality competence test provided in the app up to 10 times independently to track their empathy development. To ensure transparency in the assessment system, the AI-enhanced MoralQ application was trained on a dataset of empathetic text responses manually annotated by a team of experts in psychology and character education. The AI-enhanced MoralQ app learned to identify linguistic patterns, the richness of empathetic vocabulary, the depth of problem-cause analysis, and the consistency of pre-service teachers' moral decision-making, all based on Borba's moral intelligence assessment rubric.

Pre-test data came from the initial empathy section of the personality competence test, while post-test data came from the final test. The descriptive responses were converted into numerical values using three algorithmic methods in the copyrighted Moral IQ app. The AI-enhanced MoralQ app evaluates pre-service teachers' vocabulary richness, depth of thought, root cause analysis, decision-making logic, problem-solving consistency, moral awareness, and internalization of ethical values. In addition to automated AI assessment, the researchers engaged two professional educational counselors as human raters. These counselors independently re-evaluated student essay responses without knowing the scores generated by the AI system through a "blind scoring" approach. This step justifies that the empathy assessment using the AI-enhanced MoralQ app remained grounded in human perspective and objectivity, while also ensuring it was free from bias. Results are given as scores from 0 to 100, summarized as follows.:

Table 4
The level of empathy

Range of values	Empathy level
81 – 100	Very high
61 – 80	High
41 – 60	Moderate
21 – 40	Low
1 – 20	Very low

Note. Empathy levels are divided into five categories, ranging from very low to very high, with a 20-point range at every level.

Data Analysis Technique

We analyzed pre-test and post-test data using descriptive statistics to determine the mean, lowest and highest values, and standard deviation to evaluate students' achievements before and after treatment with the MoralQ application. To examine improvements in empathy personality competence among pre-service teachers, we used a paired-sample t-test to assess the application's effectiveness. To quantify the application's effect size, we conducted a Cohen's d analysis. The following table serves as a reference for interpreting the application's effect on pre-service teachers' empathy.

Table 5
The level of Cohen's d value

Cohen's d (absolute)	Effect size
> 0.80	Large
0.50 – 0.80	Medium
0.20 – 0.50	Small
0.00 – 0.20	Very small

Note. Application effect size levels based on the absolute score.

RESULTS

Data presentation

Table 6 shows that most pre-service teachers' pre-test empathy levels fall into the moderate level (55%), with 1% at a very low level and no one at the very high level. Meanwhile, the post-test results indicate that most pre-service teachers' empathy levels are high, with 46% of the sample in this category and 6% in the very high category.

Table 6
Pre-service teachers' empathy levels measured before and after testing.

Test	Empathy level	Number of samples	Percentage	Total number
Pre-test	Very high	0	0 %	138
	High	47	34 %	
	Moderate	76	55 %	
	Low	14	10 %	
	Very low	1	1 %	
Post-test	Very high	8	6 %	138
	High	64	46 %	
	Moderate	54	39 %	
	Low	12	9 %	
	Very low	0	0 %	

Descriptive statistics analysis

The data were then analyzed qualitatively and descriptively to determine the distribution of scores for each test, both pre-test and post-test. The results are as follows:

Table 7
Descriptive statistics for the pre-test and post-test

Test		Statistic	Std. error
Pre-test		56.45	1.04
	Mean		
	95% confidence interval for the mean		
	Lower bound	54.40	
	Upper bound	58.50	
	5% trimmed mean	56.73	
	Median	57	
	Variance	150.53	
	Standard deviation	12.27	
	Minimum	20	
	Maximum	77	
	Range	57	
	Interquartile range	13,00	
	Skewness	-0.57	
	Kurtosis	0.23	
Post-test		61,95	1,12
	Mean	59.76	
	95% confidence interval for the mean		
	Lower bound		
	Upper bound	64.14	
	5% trimmed mean	62.07	
	Median	63	
	Variance	171.83	
	Standard deviation	13.11	
	Minimum	33	
	Maximum	87	
	Range	54	
	Interquartile range	17.00	
	Skewness	-0.30	
	Kurtosis	-0.60	

Table 7 shows the results of the descriptive statistical analysis for the pre-test and post-test. The pre-test results indicate a mean of 56.45, with a range of 20 to 77 and a standard deviation of 12.27. Meanwhile, the post-test results show a mean of 61.95, with a range of 33 to 87 and a standard deviation of 13.00.

Figure 8 summarises the descriptive statistics results. The results indicate increases in the mean, median, and other statistics. The small difference in standard deviation between the pre-test and post-test (0.84) demonstrates the consistency of the pre-service teachers' empathy scores throughout the test.

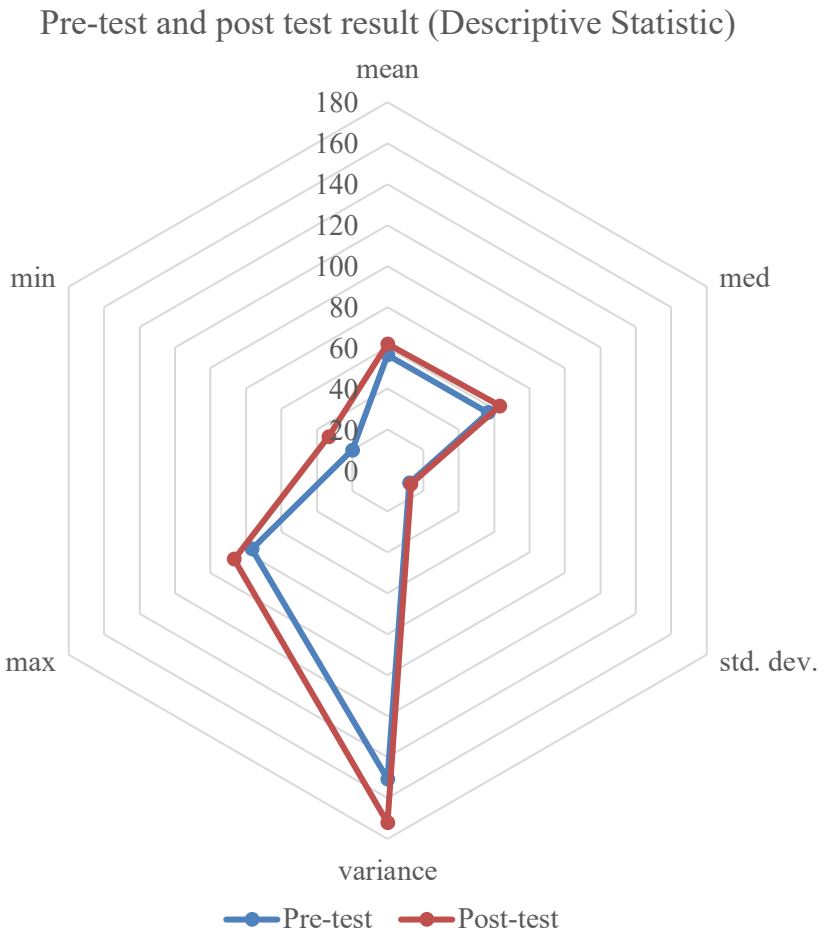

Figure 8. *Analysis of descriptive statistics before and after the test*

Prerequisite test prior to hypothesis testing

After conducting the descriptive statistical analysis, a prerequisite assessment was carried out in the form of a normality test on the pre-test and post-test data. The results of the normality analysis are described as follows:

Table 8
Test of Normality

Test	Kolmogorov-Smirnov		
	Statistic	Df	Sig.
Pre-test	0.143	137	0.116
Post-test	0.226	137	0.116

Table 8 shows that the significance value of Kolmogorov-Smirnov normality testing for both the pre-test and the post-test is 0.116, which exceeds the standard alpha threshold of 0.05. This indicates that the pre-test and post-test data are normally distributed, allowing us to proceed to the next stage of analysis. The normality results are visualized in the following chart.

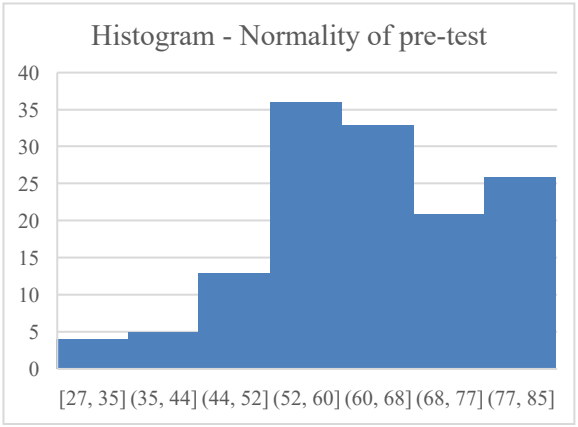

Figure 9. *Normality pre-test*

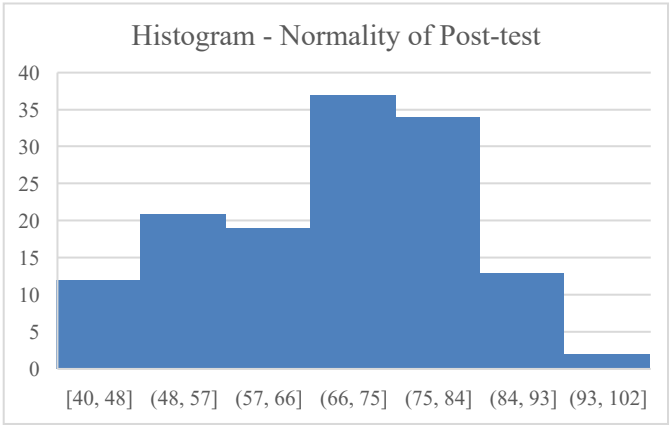

Figure 10. *Normality post-test*

Figure 9 shows that the pre-test scores follow a normal curve, with greater right skewness. Figure 10 also indicates the same normality result, but the skewness is more directed towards the left.

Hypothesis testing

T-Test analysis

The analysis continued with a paired-sample t-test. This test compares the means of two scores obtained from the sample: before and after treatment with the MoralQ application. The results of the analysis are as follows:

Table 9

Paired samples statistics

Pair	Mean	Paired differences				t	df	Sig. (2-tailed)
		sd	Std. error mean	95% confidence interval of the difference				
				lower	Upper			
Pair 1 Pre-test – Post-test	-5.50	0.84	0.07	-5.36	-5.64	-8.93	137	0.000

Table 9 shows that the p-value is less than 0.05, so H0 is rejected, and Ha is accepted. This indicates a significant difference in the specific personality competence, particularly empathy, of pre-service teachers before and after receiving treatment with the AI-enhanced MoralQ application.

Cohen's d analysis

To determine the magnitude of the MoralQ application treatment effect, the analysis continued with Cohen's d test. The results are as follows:

Table 10
Paired samples effect size

Pair	Mean of Cohen's d	Standard deviation of Cohen'sd	Score of Cohen's d
Pair 1 Pre-test – Post-test	5.50	7.17	0.77

Table 10 shows a Cohen's d of 0.77, indicating a large effect. Most pre-service teachers gained significant benefits from using the AI-enhanced MoralQ application to enhance their empathy.

DISCUSSION AND CONCLUSIONS

The hypothesis-testing results indicate that the MoralQ intervention significantly enhanced empathy awareness among pre-service teachers. This improvement is evidenced by a notable rise in average scores from pre-test ($M = 56.45$, $SD = 12.27$) to post-test ($M = 61.95$, $SD = 13.11$), with a t-value of -8.93 ($p < 0.05$). The treatment had a considerable effect, reflected by a Cohen's d of 0.77, suggesting a meaningful educational influence. This growth results from the combined effect of the entire AI-enhanced MoralQ application features. The platform combines several key features: secure Single Sign-On (SSO) access to protect participant privacy, a progress dashboard to support self-regulated learning, real-time essay-based empathy evaluations, a peer discussion forum, and a customized Chat AI interface. Through engagement with this comprehensive platform, pre-service teachers follow a structured pedagogical pathway. It shifts from self-reflection and collaborative problem-solving to personalized counseling. This system systematically develops their personal skills before they begin school-teaching practice and service. This holistic strategy directly tackles the shortcomings of traditional, resource-limited teacher training in Indonesia, where systematic empathy mentorship has often been neglected.

For instance, in response to a scenario on how to comfort a student experiencing severe stress, a participant's pre-test response was brief and compliance-focused: "I will tell the student to stay calm and focus on their academic tasks so they do not fall behind" (Participant 18, scenario 5, pre-test answer). However, after 10 weeks of utilizing the AI-enhanced MoralQ application, the same participant's post-test response showed a profound qualitative shift toward deep empathy:

> I will approach the student privately, use non-verbal cues like nodding to establish trust, and tell them: I can see that you are carrying a very heavy burden right now. Let us find a quiet space to talk, and we can figure this out together. I am here to support you. (Participant 18, scenario 5, post-test answer)

This qualitative improvement provides concrete evidence that the AI-enhanced MoralQ app's personalized feedback loop helps pre-service teachers internalize core ethical values and refine their communication logic. These results align with previous studies that suggest AI-enhanced digital technology facilitates the learning process by overcoming spatial and temporal limitations (Tapalova & Zhiyenbayeva, 2022). As other researchers have noted, AI-driven systems can be tailored to meet user requirements (Babu et al., 2025). The personalized content stored in the AI database enhances engagement among pre-service teachers by meeting their specific needs. This aligns with research claiming that AI makes learning more accessible and greatly enhances understanding (Rajak et al., 2024).

The rise in empathy also stems from incorporating daily case scenarios and peer collaboration into the app. The discussion forum allows users to exchange best practices for handling current cases, like juvenile delinquency, which are particularly relevant for future educators. Additionally, qualitative

feedback from these forums supports the quantitative data showing the feature's effectiveness. For example, a pre-service teacher shared:

> Today during my microteaching session, I struggled with a peer acting as a student who was constantly disrupting the class. My immediate reaction was to punish them, but after reflecting on the empathy scenarios, I decided to pull them aside afterwards to ask if they were facing any personal difficulties. (Participant 31, paragraph 1)

Another peer responded in the forum: "I experienced the same thing! Asking them how they felt, rather than accusing them, completely changed their attitude. We must act as role models of emotional regulation" (Participant 68, paragraph 1). This collaborative exchange shows how the forum turns theoretical educational psychology into active moral reflection. The forum feature supports various ways to share best practices for managing current cases that are viral among pre-service teachers or educators dealing with juvenile delinquency. Users can ask questions and respond with solutions based on their experiences and successful interventions. This aligns with the finding that the forum in AI-enhanced MoralQ to connect daily cases to simulated apps can increase moral awareness (Nguyen et al., 2024). Research shows that exchanging ideas can expand perspectives on the best actions and foster empathy.

Additionally, the Chat AI feature in the AI-enhanced MoralQ app acts as an on-demand virtual counselor embedded within the larger MoralQ system. It helps aspiring pre-service educators develop empathy through practical dialogue activities. This feature enables pre-service teachers to delve into case scenarios more thoroughly with prompts that gradually become more detailed. Many pre-service teachers find it hard to express empathy verbally because of limited classroom experience. The Chat AI supports this by proposing helpful vocabulary and empathetic expressions. Logs from Chat AI interactions indicate active cognitive reframing, such as when a user prompted the AI: "How should I address a student who feels they are being treated unfairly by others?" (Participant 29, question to AI 1) The Chat AI provided a template validating the student's feelings while maintaining professional boundaries, and replied:

1. Empathy (Validating Feelings)

Concrete Teacher Action: Listening actively without interrupting, avoiding immediate judgment or blame, and creating a safe space for students to express their emotions.
Example Statement: I understand that this situation makes you feel deeply disappointed and unfairly treated. It is completely natural to feel sad, and thank you for being open enough to share this with me.

2. Conscience (Moral Reflection)

Concrete Teacher Action: Guiding students to calm down and reflect on the situation by consulting their conscience and principles of integrity, ensuring they are not driven solely by anger.
Example Statement: Let us take a moment to breathe and reflect with a cool head. What does your conscience tell you is the virtuous or wise course of action we should take, even though this situation feels difficult?

3. Fairness (Objectivity and Balanced Solutions)

Concrete Teacher Action: Maintaining a neutral stance (avoiding taking sides with the student or other parties), gathering facts objectively, and committing to upholding rules that are fair to everyone involved.

Example Statement: I want to ensure that everyone is treated fairly. Let us examine this issue objectively from various perspectives, then find the best solution. One that is fair and does not disadvantage anyone.
(Participant 29, AI response 1)

The findings align with research suggesting that real-time AI feedback can help teachers become more perceptive, responsive, and accurate in addressing students' evolving needs (Hamzaoui et al., 2024). AI simplifies the process of developing new, expansive perspectives and obtaining a holistic understanding of a case (Marisa et al., 2024).

The MoralQ application's feature also assists pre-service teachers in enhancing their social skills with students by fostering empathy. It offers appropriate words and phrases to express understanding after specific experiences. Next-generation educators who find it hard to articulate their thoughts can get verbal suggestions to communicate more effectively and with empathy. This supports research indicating that the app can review sentences with varied vocabulary that show empathy. (Liu et al., 2025; Su et al., 2025). Consequently, pre-service teachers' communication skills become more respectful and appreciated. It encourages pre-service teachers to use the app often, learn diverse expressions, and strengthen their empathy. This process is most effective when pre-service teachers are eager to become literate, meaning they read and thoroughly understand the provided materials. MoralQ app offers a variety of solutions suited to different situations, helping pre-service teachers acquire extensive experience in responding appropriately. This boosts their awareness of empathy during interactions with students. Addressing juvenile delinquency cases with empathy increases pre-service teachers' confidence in their professional roles. These findings align with research showing that the app enables users to explore solutions and strategies derived from shared experiences stored in the AI database (Rozputnia et al., 2025). However, pre-service teachers should also be cautious when choosing actions, as what works in one situation may not suit them in another.

Research indicates that using an AI-enhanced learning platform aids pre-service teachers in developing empathy awareness, as assessed by the MoralQ app. AI provides real-time learning experiences that align with everyday situations and further enhances empathy understanding. Incorporating AI into applications can strengthen vocabulary and sentences that demonstrate empathy toward students, thus promoting moral growth. However, developers should limit interactions with certain algorithms to ensure comments remain relevant and to prevent the spread of hatred, which could lead to hostility. Pre-service teachers are encouraged to view cases from multiple perspectives, avoiding judgments based solely on errors without understanding their causes.

IMPLICATIONS

The broader educational implications of these findings are particularly important for teacher training programs, especially in countries like Indonesia that are reforming their curricula. Building personal skills and moral integrity in pre-service teachers involves shifting from passive learning to active, technology-supported ethical reflection. The MoralQ app addresses critical resource and mentorship shortages in higher education by offering real-time, personalized, and scalable empathy training. Since teacher empathy is essential for positive interactions with students, this demonstrates how mobile educational technologies can systematically develop these social-emotional skills. Incorporating AI tools like MoralQ into teacher development can create resilient, emotionally skilled educators capable of fostering supportive, anxiety-free classrooms. This highlights AI’s significant potential in moral education within higher education. However, developers should provide detailed guidelines on content that may conflict with social norms. Interaction platforms need algorithms to keep discussions focused and respectful, preventing hate speech that could lead to conflicts.

Future research should evaluate the effectiveness of the MoralQ prototype by comparing it with similar ChatAI innovations to determine overall performance. Another study could implement the app on a larger scale with more users to test its stability under higher demand. These evaluations will help demonstrate the app's benefits, increasing its potential for widespread adoption among future educators in various contexts.

Author Contributions: Samsul Arifin led the initial drafting process, covering the introduction, theoretical framework, system description of the MoralQ application, and interpretation of findings. Dwi Setiyadi played a key role in developing the background context, organizing the literature review on AI integration and personal competence, and thoroughly reviewing and editing the draft for clarity. Wisnu Kurniawan was responsible for composing the methodology, analytical procedures, and presenting statistical results. Sutri Ekawati contributed by detailing the participant context, structuring data tables for qualitative and quantitative information, creating visual illustrations, and proofreading the manuscript. All authors collaboratively reviewed, refined, and approved the final version before submission.

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