The Effectiveness of The Problem-Based Learning Model on Student Learning Achievement in Islamic Education Learning

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Sections Info	ABSTRACT
	Objective: This study aims to assess the effectiveness of the Problem-Based Learning (PBL) model on students' academic achievement in Islamic Education Learning in class VIII at MTs An-Nuur Trisono. **Method:** Using a pseudo-experimental design with a pretest-posttest control group design, the study involved two classes: one experimental group that followed Islamic Education Learning with PBL, and one control group with conventional models. Data was collected through tests covering Islamic Education Learning's subject matter. **Results:** Statistical analysis showed a significant increase in students' learning outcomes using PBL (65.6%) compared to the conventional model (41.2%). **Novelty:** Students who engaged in PBL learning showed better concept understanding, application of moral values, and problem-solving skills. This study provides empirical support for the effectiveness of PBL in improving Islamic Education Learning's learning outcomes. The implications of this study emphasize the importance of applying innovative learning models such as PBL to improve the quality of Islamic religious education in secondary schools. The findings will guide teachers, schools, and education stakeholders in developing more effective learning approaches.

INTRODUCTION

A significant responsibility in education lies in the hands of religious leaders and educators, particularly in transforming the science of religious education for students. This transformation aims to convey religious knowledge within a framework that emphasizes universal values and promotes recognition and respect for diversity (Jasril et al., 2024; Pitorini et al., 2024). In Indonesia, Madrasah Tsanawiyah (MTs) holds a crucial role in student development, particularly in Islamic education. MTs serve as the first secondary-level education institution offering Islamic religious education, imparting important principles, moral values, and ethics of Islam in daily life (Amerstorfer & Freiin von Münster-Kistner, 2021; Wulandari & Hastini, 2024). MTs An-Nuur Trisono is one of the formal educational institutions based on Islamic boarding schools located in Babadan District, Ponorogo Regency. In the 2023-2024 academic year, MTs An-Nuur Trisono has four classes, namely 1 class VII, two classes VIII, and 1 class IX. In addition to general education, MTs An-Nuur Trisono provides Islamic religious education. Islamic Religious Education learning has a vital role in forming noble morals. Learning Islamic religious education aims to understand religious concepts and human relationships with God.

Islamic Religious Education Learning is an integral part of the curriculum, and it has a vital role in the education of students. The values in this learning are fundamental to be applied in daily life (Gök & Boncukçu, 2023; Wulandari & Hastini, 2024). Through learning Islamic Religious Education, students are given an understanding of the

Learn the fundamental teachings of Islam, including beliefs, worship practices, morality, ethics, and social values upheld in Islam, and gain a deep understanding of how religious teachings can be implemented in daily life to achieve the welfare of individuals and society as a whole.

The effectiveness of learning can be measured by achieving all competency indicators by learning targets, both in the process and in students' learning outcomes. In Islamic Education Learning, the goal is to guide children to have good behavior and morals (Colmenares-Quintero et al., 2023; Pratiwi & Ansie, 2024). The quality of learning Islamic Education Learning, good or bad, will have a direct impact on student behavior because schools have an essential role in shaping children's character (Khaidir & Suud, 2020; Komariah & Nihayah, 2023; Rusli & Nurdin, 2022; Zubairi & Nurdin, 2022). The benefits of learning Islamic Religious Education include 1) Strengthening individual Islamic identity, 2) Helping in the formation of good character and strong morality, and 3) Providing a deep understanding of Islamic teachings (Trullàs et al., 2022).

The need marks the current trend in Islamic Education Learning for more attractiveness and effectiveness of the learning models employed by teachers, resulting in insufficient improvement in student learning achievement. Conventional teaching methods prevail, failing to engage students actively, stimulate discussions, or promote the application of Islamic values in daily life (Nasucha et al., 2023). Students' participation in learning is minimal, with the majority of teachers leading the process, leading to a less-than-clear understanding of the material and diminishing overall effectiveness (Fadhilah et al., 2023; Seibert, 2021). Observations at MTs An-Nuur Trisono reveal persistently low student learning achievements, particularly evident in the Midterm Exam scores of eighth-grade students, where only 51.94% achieved completeness. This indicates that many students need to meet the minimum criteria for proficiency in Islamic Education Learning. Consequently, there is a pressing need for improvement in learning implementation to address these challenges.

The Problem-Based Learning (PBL) model presents a dynamic approach applicable to teaching Islamic Education Learning. It centers around students gradually solving problems through scientific models, facilitating their acquisition of problem-related knowledge (Gök & Boncukçu, 2023; Luke et al., 2021). According to Widiasworo, this model introduces contextual problems into the teaching and learning process, encouraging learners to engage in learning actively. Overall, the PBL model actively involves students during learning, enhancing their critical thinking, problem-solving skills, and conceptual knowledge acquisition. Key characteristics of PBL learning include posing questions/problems, interdisciplinary connections, authentic investigation, generating and presenting products, and collaboration (Trullàs et al., 2022; Wulandari & Hastini, 2024).

Given the potential benefits outlined above, it is evident that the PBL model can enhance students' learning outcomes, addressing the urgency in Islamic Education Learning to effectively integrate the concepts and implementations of hablum minallah and hablum minannas. This research explores the PBL model's effectiveness on students' learning outcomes in Islamic Education Learning class VIII at MTs An-Nuur Trisono. Employing a quantitative research approach, the study seeks empirical evidence supporting the PBL model's implementation as an effective learning strategy in this school (Pratiwi & Ansie, 2024). By delving deeply into how the PBL model influences students' learning outcomes, this research is poised to significantly

contribute to curriculum development and teaching practices at MTs An-Nuur Trisono while offering valuable insights into religious and moral education more broadly.

RESEARCH METHOD

This study employs a quantitative research approach, adopting a quasi-experimental design outlined by Arga et al. (2022). The experimental setup utilizes a Non-Equivalent Control Group Design, akin to a pretest-posttest control group design, with both experimental and control groups intentionally selected rather than randomized. The research methodology follows a pretest and posttest group design, where initial measurements (pretests) are taken before treatment, and subsequent measurements (posttests) are conducted afterward. The study involves two groups representing the initial conditions of students: the experimental and control class groups, as referenced by Arga et al. (2022) and Heru et al. (2021). Both groups undergo pretest and posttest assessments to evaluate student learning achievement in Islamic Education classes VIII A and B at MTs An-Nuur Trisono. The research design for the pretest and posttest group design is structured in Table 1.

Table 1. Research design.

Group	Class	Pretest	Treatment	Posttest
Experiment	VIII A	O_{11}	X_1	O_{12}
Control	VIII B	O_{21}	X_2	O_{22}

Description:

E	= Group with Problem-Based Learning model
K	= Group with Conventional learning model
X_1	= Treatment in the form of learning with the PBL learning model
X_2	= Treatment in the form of learning with Conventional learning
O_{11}	= Pretest results of Experiment class
O_{21}	= Pretest results of Control class
O_{12}	= Experiment class final test results (Posttest)
O_{22}	= Final test results (Posttest) Control class

This study focuses on 38 eighth-grade students from MTs An-Nuur Trisono. Employing Non-Probability Sampling, particularly purposive sampling, ensures that not every member of the population has an equal chance of being selected as a sample (Novita et al., 2022; Nuraini et al., 2022). Purposive sampling involves using all population members as samples, a model typically chosen for smaller populations, fewer than 30 individuals, or studies aiming for generalized results with minimal error.

This study involved all eighth-grade students from classes VIII A and VIII B at MTs An-Nuur Trisono, with 19 students in each class. Class VIII A was the experimental group, while Class VIII B was the control group. The research took place at MTs An-Nuur Trisono, utilizing two groups: the experimental group received special treatment using the Problem-Based Learning model. In contrast, the control group underwent conventional learning. Data collection methods included documentation, testing, and observation. Pretest and posttest measurements were utilized, and validity and reliability were tested. Subsequent analyses included normality and homogeneity testing, followed by hypothesis testing.

The initial step in this research is to conduct a validity test on the pretest and posttest instruments using the Biserial Point Correlation formula. A test item is deemed valid if

the calculated correlation coefficient (r count) exceeds the critical value (r table) and invalid if it falls below it (Rosantono et al., 2021; Saifurrahman et al., 2021; Setyadi et al., 2021). In this study, the validity test was performed on 20 questions for both pretest and posttest, resulting in all 20 questions being deemed valid. Table 2 is the validation of the instrument, a Reliability Test was conducted using the Cronbach alpha formula, with a threshold of 0.70 (Daryono et al., 2023, 2024; Supriyanto et al., 2022). The pretest and posttest question instruments demonstrated high reliability, with Cronbach alpha coefficients ranging from 0.82 to 0.93, exceeding the threshold of 0.70. With data collected from both experimental and control classes at MTs An-Nuur Trisono, the next step involved conducting a normality test using the Shapiro-Wilk test because the sample size was fewer than 50 individuals.

Table 2. Pretest and posttest instrument.

Material	Aspect	Indicator	Question Number	
Instilling Noble Character Traits (Effort, Trust, Patience, Gratitude, and Contentment)	Knowledge	Understanding about Effort, Trust, Patience, Gratitude, and Contentment.	1,2,3,4,5	1,5,9,13,17
	Understanding	I understand the positive impacts of Effort, Trust, Patience, Gratitude, and Contentment.	6,7,8,9,10	2,6,10,19
	Application	I am applying the behaviors of Effort, Trust, Patience, Gratitude, and Contentment in daily life.	11,12,13, 14,15	3,7,11, 14,15,18
	Evaluation	It is knowing the evidence regarding Effort, Trust, Patience, Gratitude, and Contentment.	16,17,18, 19,20	4,8,12, 16,20
		Quantity		20

RESULTS AND DISCUSSION
Results
The cognitive learning achievements of eighth-grade students from MTs An-Nuur Trisono were assessed through a pretest before the commencement of learning activities in experimental and control classes. Subsequently, researchers implemented the Problem-Based Learning approach in the experimental class and conventional teaching models in the control class. The typical learning structure involved introductory activities, followed by core instructional tasks, and concluded with closing activities (Mukaromah & Harun, 2024; Ulger, 2018). During the learning process, students listened to the material explanation, asked questions, and evaluated and summarized the learning at the end of the session. In addition, they were also given a Learner Worksheet at the end of the learning as part of the posttest, hoping to measure the learning outcomes (Jasril et al., 2024; Pitorini et al., 2024). The pretest and posttest data from the experimental and control classes were collected, and the results are presented in Table 4.

Table 4. Pretest and posttest results of experiment class and control class students.

Learner Code	Cognitive Learning Outcomes		Learner Code	Cognitive Learning Outcomes	
	Pretest	Posttest		Pretest	Posttest
E-01	65	90	K-01	50	70
E-02	50	85	K-02	55	75

Learner Code	Cognitive Learning Outcomes		Learner Code	Cognitive Learning Outcomes	
	Pretest	Posttest		Pretest	Posttest
E-03	55	80	K-03	60	70
E-04	60	75	K-04	65	85
E-05	60	90	K-05	45	70
E-06	45	70	K-06	60	75
E-07	65	85	K-07	50	70
E-08	70	95	K-08	65	80
E-09	50	80	K-09	50	75
E-10	60	85	K-10	60	70
E-11	60	90	K-11	65	80
E-12	55	85	K-12	45	65
E-13	65	90	K-13	55	65
E-14	45	75	K-14	65	80
E-15	60	90	K-15	60	85
E-16	50	85	K-16	55	80
E-17	65	95	K-17	60	80
E-18	60	85	K-18	50	65
E-19	70	90	K-19	55	70

Table 4 displays the pretest and posttest outcomes of student learning in both the experimental and control classes. It's evident that before introducing the Islamic Education Learning curriculum focusing on Virtuous Morality, the pretest scores of students in the experimental group fell below the passing grade average. However, following instruction using the Problem-Based Learning approach, their posttest scores showed a notable improvement. Conversely, students in the control group did not understand the Virtuous Morality content during the pretest and posttest assessments, resulting in scores below the passing grade average. Despite receiving conventional teaching models, the improvement in their posttest scores was not significant. This study involved 38 participants, fewer than the recommended 50. Hence, the Shapiro-Wilk test was employed for the normality assessment. The subsequent section presents the outcomes of the Shapiro-Wilk test.

Table 5. Shapiro Wilk normality test results.

Group	Shapiro-Wilk			Decision
	Statistic	df	Sig.	
Pretest_PBL	0.92	19	0.15	Normally Distributed
Posttest_PBL	0.91	19	0.08	Normally Distributed
Pretets_ Conventional	0.91	19	0.07	Normally Distributed
Posstest_ Conventional	0.90	19	0.06	Normally Distributed

a.   Lilliefors Significance Correction

Table 5 shows that for the PBL group, the significance value (Sig.) for the pretest is 0.15, and for the posttest is 0.08. Meanwhile, for the Conventional group, the significance value for the pretest is 0.07, and for the posttest, it is 0.06. Because the Sig. values for both groups are more significant than 0.05; according to the criteria in the Shapiro-Wilk normality test, it can be concluded that the student learning outcome data, both in the PBL and Conventional groups, have a normal distribution. Assuming that the normality assumption of the data has been met based on the Shapiro-Wilk test,

if one wants to test hypotheses to compare student learning achievement between the PBL and Conventional classes, an Independent Sample Test can be used. This technique can be applied because the assumption of data normality has been met. The researcher conducted an independent sample test to compare the pretest and posttest scores between the PBL and conventional classes.

Table 6. Independent sample test results, pretest scores for PBL class and conventional class.

		t-test for Equality of Means			Decision
		t	df	Sig. (2-tailed)	
Pretest	PBL	0.90	36.00	0.37	Not Significant
	Conventional	0.90	35.29	0.37	Not Significant

The analysis of the Independent Sample Test presented in Table 6 reveals no notable difference in the pretest outcomes between the PBL and Conventional classes. The significance value (sig.) of 0.37 indicates insufficient evidence to reject the null hypothesis (H0), posing no significant disparity in pretest results between the PBL and Conventional classes. Conversely, the alternative hypothesis (Ha) suggests a significant difference. However, with a significance value exceeding 0.05, precisely 0.371, there isn't adequate statistical support for Ha. Thus, H0 is accepted, implying a similarity in pretest outcomes between the PBL and Conventional classes. This implies that both groups exhibited comparable pretest results before any interventions, as for the Independent Sample Test outcomes concerning posttest scores in the PBL and Conventional classes.

Table 7. Independent sample test results and posttest scores for the PBL and conventional classes were used.

		t	df	Sig. (2-tailed)	Decision
Posttest	PBL	5.13	36.00	0	Significant
	Conventional	5.13	35.94	0	Significant

The analysis of the Independent Sample Test indicates a significant contrast in posttest results between the PBL and Conventional classes. The significance value (sig.) of 0.00, which falls below the 0.05 threshold, provides substantial evidence to reject the null hypothesis (H0), suggesting no significant difference in posttest outcomes between the PBL and Conventional classes. Conversely, the alternative hypothesis (Ha) proposes a significant difference, supported by the meager significance value of 0.00. Consequently, H0 is dismissed, and Ha is upheld, indicating dissimilarity in posttest outcomes between the two groups after the intervention. This suggests varying student learning achievement between those instructed with Problem-Based Learning and those with conventional models in eighth-grade Islamic Education Learning, focusing on Virtuous Morality. To further explore the influence of teaching models on student learning achievement, namely Problem-Based Learning and Conventional models, a Paired Sample Test was conducted, yielding the subsequent results in Table 8.

Table 8. Paired sample test results.

		t	df	Sig. (2-tailed)	Decision
Pair 1	Pretest_PBL - Posttest_PBL	-23.13	18	0.00	Significant

		t	df	Sig. (2-tailed)	Decision
Pair 2	Pretest_ Conventional - Posttest_ Conventional	-15.33	18	0.00	Significant

According to the test outcomes in Table 8, there is a noticeable contrast between the pretest and posttest results within each group. The significance value (sig.) of 0.00, below the 0.05 threshold, provides sufficient evidence to dismiss the null hypothesis (H0), which posits no significant difference between pretest and posttest results within the same group. Conversely, the alternative hypothesis (Ha) suggests a significant difference, supported by the very low significance value of 0.00. Consequently, H0 is refuted, and Ha is upheld, indicating a substantial shift between the initial (pretest) and final (posttest) conditions within each group (both PBL and Conventional classes). This implies significant progress or change within the groups throughout the study. It is moving forward to examine the disparity in average learning outcomes between students in the experimental class utilizing the Problem-Based Learning model and those in the control class employing the Conventional model, either through the N-Gain Test or by comparing pretest and posttest scores likely In Table 9.

Table 9. N-Gain test data score.

	Class	N	Mean	Std. Deviation	Std. Error Mean	Decision
N-Gain	PBL	19	65.54	12.09	2.77	Effective Enough
	Conventional	19	41.21	11.10	2.54	Less Effective

Based on the calculation results of the N-gain test in Table 9, it shows that the average N-gain value for the experimental class (Problem-Based Learning model) is 65.5493 or 65.6%, which falls into the category of moderately effective, with a minimum N-gain value of 37.50% and a maximum of 85.71%. Meanwhile, the average N-gain value for the control class (Conventional model) is 41.21 which falls into the category of less effective, with a minimum N-gain value of 22.22% and a maximum of 62.50%.

Discussion
Implementing the PBL model in the Islamic Education Learning for eighth-grade students at MTs An-Nuur Trisono significantly impacts student learning achievement. From the data analysis results above, it is evident that there is a 65.60% increase in students' cognitive learning outcomes, which is the result of using the Problem-Based Learning model in teaching. The Problem-Based Learning model offers several advantages compared to other teaching models (Fadhilah et al., 2023; Seibert, 2021). Firstly, PBL allows students to actively engage in solving problems relevant to the content of Islamic Education Learning. In this process, students memorize facts and deeply understand concepts as they apply their knowledge in real-world situations. Secondly, the learning process with Problem-Based Learning encourages students to think critically in problem-solving. They must analyze information, evaluate various options, and make rational decisions. This helps students develop critical thinking skills crucial in daily life and understanding religious teachings more profoundly (Pratiwi & Ansie, 2024).

Thirdly, the Problem-Based Learning model can enhance students' motivation and engagement. Active participation in PBL-driven learning promotes increased student motivation and engagement (Colmenares-Quintero et al., 2023; Luke et al., 2021). They

feel more enthusiastic about learning because the material is presented in a context relevant to their lives. Additionally, collaboration in problem-solving helps build social skills and teamwork. Fourthly, the Problem-Based Learning model helps develop collaboration skills among students, reinforcing their social skills and preparing them for future teamwork (Amerstorfer & Freiin von Münster-Kistner, 2021; Gök & Boncukçu, 2023). Fifthly, the Problem-Based Learning model teaches students about academic subjects and contributes to character and moral formation. In solving complex problems, students are encouraged to consider ethical and moral values in decision-making. This strengthens their understanding of religious teachings and helps them internalize moral values in their daily actions (Luke et al., 2021; Wulandari & Hastini, 2024).

In the implementation of the Problem-Based Learning model besides numerous advantages, several factors act as barriers to implementing the Problem-Based Learning model (Mukaromah & Harun, 2024; Trullàs et al., 2022). Including 1) Limited resources such as time, space, and sufficient materials to facilitate effective learning, 2) Formation of unbalanced or mismatched work groups according to students' abilities can also hinder the effectiveness of Problem-Based Learning model, and 3) Evaluation process becomes quite challenging as this approach emphasizes problem-solving and contextual understanding rather than factual knowledge, which can make it difficult for teachers to assess students' achievements objectively (Fadhilah et al., 2023; Pitorini et al., 2024).

However, conventional models also have several advantages when applied to learning. The strengths or advantages of the conventional model are as follows: 1) Easy assessment process, often based on relatively easy-to-implement and evaluate standard tests and exams; 2) Time efficiency, with proven structures and emphasis on factual knowledge, conventional learning is considered more efficient in terms of time usage; and 3) Ease of application and relatively low cost compared to modern learning models that utilize technology. Other findings also indicate that Problem-Based Learning models can improve students' learning outcomes (Farhan et al., 2022; Hadiyanto et al., 2021). This is evidenced by one study obtained from searches on Google Scholar and Google Scholar by Agus Robiyanto, which explains that the average learning outcomes of students before the action research were 57.14, and after the action research with the implementation of the Problem-Based Learning model, there was an increase to 79.09, indicating that the Problem-Based Learning model is capable of improving student learning achievement (Purnomo et al., 2020).

Research conducted in class VIII at MTs An-Nuur Trisono states that using problem-based learning models in teaching Islamic education is still moderately effective. Therefore, development is needed to enhance the effectiveness of using Problem-Based Learning models in teaching. Many aspects can help improve the effectiveness of using Problem Learning models in enhancing students' learning outcomes, such as 1) Learning context, 2) Learning input, 3) Learning process, 4) Product, and 5) Output or outcome (Nurtanto et al., 2020; Sokpheng & Meng, 2022).

Collaboration and active engagement are crucial elements in enhancing the PBL model's impact on student learning achievement. Teachers play a pivotal role in creating a supportive environment by selecting relevant problems, fostering deep discussions, and providing tailored guidance (Mukaromah & Harun, 2024; Ulger, 2018). Meanwhile, students must actively participate in problem-solving, collaborate with peers, and reflect on their learning regularly. This interaction between teachers and

students is fundamental to improving understanding, problem-solving skills, and overall learning achievement (Pratiwi & Ansie, 2024; Trullàs et al., 2022). Moreover, learning input is vital to optimizing the impact of the PBL model. It begins with aligning problem selection with students' comprehension levels and the learning context. Teachers should offer clear guidelines while encouraging students to seek additional information and collaborate to find solutions (Colmenares-Quintero et al., 2023; Jasril et al., 2024). Simultaneously, students should develop information-seeking skills, analyze data, and work collaboratively. Aligning learning input with students' needs and abilities ensures that PBL effectively enhances conceptual understanding and overall learning achievement.

Regarding the learning process, teachers must act as active facilitators, guiding students through problem-solving processes with clarity and support (Pitorini et al., 2024; Seibert, 2021). Encouraging students to actively formulate questions, seek solutions, and reflect on their learning process fosters critical thinking skills and problem-solving abilities. Collaboration between teachers and students is vital to making PBL an effective tool for improving overall student learning achievement (Amerstorfer & Freiin von Münster-Kistner, 2021; Junior et al., 2021).

Another aspect is the product aspect, which involves facilitating the development of creative and relevant products related to the given problem (Rodríguez & Pérez, 2021; Wulandari & Hastini, 2024). Teachers can provide clear guidelines while allowing students to express their ideas innovatively. Collaboration sessions and feedback between peers and teachers can enhance the quality of the final product (Bürgermeister et al., 2021). By encouraging the creation of real-world applicable products, such as presentations or prototypes, PBL ensures that student learning achievement extends beyond conceptual understanding to practical application (Mukaromah & Harun, 2024; Wulandari & Hastini, 2024).

Comprehensive and ongoing evaluation of student-generated problem-solving is essential regarding the output or outcome aspect. Clear evaluation rubrics aligned with learning objectives enable assessment of conceptual understanding, creativity, critical thinking skills, and collaboration (Hadiyanto et al., 2021; Jasril et al., 2024). Structured reflection sessions help students identify strengths and areas for improvement, while constructive feedback and opportunities for revision encourage the development of sustainable skills and meaningful learning outcomes (Trullàs et al., 2022). This approach ensures that the PBL model supports the development of skills relevant to contemporary needs and produces meaningful learning outcomes for students.

CONCLUSION
Fundamental Finding: Despite its various benefits, implementing the Problem-Based Learning model also faces particular challenges. Thorough material preparation, efficient time management, and support from the school and teachers are crucial for the success of PBL. Additionally, evaluation of the effectiveness of this model needs to be continuously conducted to ensure that learning objectives are optimally achieved. There is a need for further development to enhance the effectiveness of using the Problem-Based Learning model in teaching to maximize students' learning outcomes. Many aspects can contribute to enhancing the effectiveness of using the Problem-based Learning model in improving students' learning outcomes, such as 1) Learning context, 2) Learning input, 3) Learning process, 4) Product, and 5) Output or outcome. **Implication:** In this discussion, it has been revealed that the Problem-Based Learning

(PBL) learning model positively impacts student learning outcomes in Islamic Religious Education subjects for grade VIII students at MTs An-Nuur Trisono. PBL helps students understand the material in depth through a challenging and relevant approach, develop critical thinking skills, and strengthen their religious identity. **Limitation:** Despite facing some challenges in its implementation, PBL offers significant opportunities to improve the quality of religious and moral education in schools. **Future Research:** Nonetheless, it is essential to remember that the successful implementation of PBL depends on a good understanding of the method and adequate resource support. Therefore, further research and efforts to develop teachers' professionalism in the field of PBL are needed to ensure the sustainability and improvement of learning quality in the future.

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