

## EXPLORING THE INFLUENCE OF THE KoPI LOKAL ISLAMI LEARNING MODEL AND GENDER ON 21<sup>st</sup>-CENTURY SKILLS IN ISLAMIC ELEMENTARY SCHOOLS

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### ABSTRACT

This study aimed to determine the influence of the KoPI Lokal Islami (KLI) learning model, gender, and their interaction on 21<sup>st</sup>-century skills. This study used an experimental method through a factorial design. The study involved 174 students from Islamic elementary schools, divided into three treatment groups: 58 students in the KLI model, 58 in the cooperative learning (CL) model, and 58 in the direct instruction (DI) model. Among the participants, 88 were male, and 86 were female. Data were collected through tests, observation sheets, and questionnaires, all of which were validated by experts. Data analysis was conducted using a two-way ANOVA, followed by Tukey HSD and LSD tests, after normality and homogeneity tests were performed. The results showed that the KLI model significantly improved 21<sup>st</sup>-century skills ( $p=0.000$ ) by creating a more contextual and meaningful learning experience. Significant differences were also found between male and female learners ( $p=0.039$ ), with females, in general, being more focused on developing 21<sup>st</sup>-century skills at primary school age. The interaction between model and gender is not significant ( $p=0.799$ ), indicating that these two factors influence 21<sup>st</sup>-century skills independently. This research makes an essential contribution to the design of learning models that are more relevant to current demands and can serve as a basis for educational policy recommendations in Islamic primary schools.

**Keywords:** KoPI Lokal Islami, Gender, 21<sup>st</sup>-Century Skills

### INTRODUCTION

Developing skills that align with the demands of the times is crucial in 21<sup>st</sup>-century education (Celik et al., 2024; Lang and Šorgo, 2024). Skills such as critical thinking, creativity, communication, and collaboration are not only basic needs in the world of work but are also key elements in preparing learners to face increasingly complex global challenges (Maor et al., 2023; Saad et al., 2024). Today's education focuses on mastering academic knowledge and developing life skills that help learners adapt to rapid changes (Fitriadi et al., 2025). Therefore, 21<sup>st</sup>-century skills have become an important part of the education curriculum in many countries, including Indonesia (Nakakoji et al., 2022; Sullivan et al., 2021).

However, in its implementation in Islamic primary schools, many challenges are faced in integrating 21<sup>st</sup>-century skills with Islamic values and local wisdom that characterize Islamic education. Although the national curriculum has begun to emphasize the importance of developing 21<sup>st</sup>-century skills, many Islamic primary schools still experience difficulties in adapting effective learning methods that not only teach knowledge but also strengthen the character and morals of students following Islamic teachings (Christopher & Revell, 2024; Kasim et al., 2022; Mahmud et al., 2023). On the other hand, with the rapid development of

technology, learners are required to master not only technical but also social and emotional skills essential to everyday life (Khasawneh, 2024; Erstad et al., 2024).

In response to this challenge, learning models that can answer these needs are needed. One model with great potential to integrate 21st-century skills with Islamic values and local wisdom is the KoPI Lokal Islami (KLI) learning model (Cooperative, Project, and Inquiry with local wisdom and Islamic values-based approaches) (Arizona et al., 2023a). This model aims to develop 21<sup>st</sup>-century skills through a more active and participatory approach by providing opportunities for learners to collaborate, work on projects together, and solve problems critically and creatively. In this model, learners are trained to think analytically and understand and practice Islamic values and local wisdom in their daily lives.

The importance of the KLI learning model lies in its ability to combine various modern learning methods with local religious and cultural values. Through this approach, learners are expected to develop critical thinking and creativity in a context relevant to their lives, while strengthening their character and morals based on Islamic teachings. This learning model is relevant for improving the quality of education in Islamic primary schools, aligning with the needs of the 21st century while introducing concepts that follow Islamic teachings (Charki et al., 2022; Kasim et al., 2022).

However, despite the great potential of this model, Islamic primary schools face the challenge of effectively integrating it into the daily learning process. Some obstacles often encountered in the field include limited trained human resources, a lack of understanding of the importance of implementing active learning models, and a gap between theory and practice in schools (Charki et al., 2022). In addition, although many schools have tried to implement cooperative learning models, there is still a lack of integration with local wisdom and Islamic values, which are important elements in developing students' character.

Various previous studies have examined the effectiveness of cooperative learning models (Emara et al., 2021; Kalmar et al., 2022), project-based learning (Asyari et al., 2024; Lee et al., 2024; Li and Zhu, 2023; Rehman et al., 2023; Sucilestari et al., 2023a), and inquiry learning (Huang & Annamalai, 2024; Morris-Eyton & Pretorius, 2023). In the context of 21<sup>st</sup>-century education, few have integrated religious values and local wisdom into the model. In addition, research examining the role of gender in the achievement of 21<sup>st</sup>-century skills is also limited. Therefore, this study is expected to fill this gap by making an essential contribution to understanding how a learning model based on local wisdom and Islamic values can improve 21<sup>st</sup>-century skills and how gender differences can affect this achievement.

This study aims to explore and assess the effectiveness of the KLI learning model in enhancing 21<sup>st</sup>-century skills in Islamic primary schools, while accounting for moderating variables, such as gender. The gender variable was chosen because it may influence how learners respond to the learning model implemented (Medina-Vidal et al., 2025). Therefore, this study also aims to compare the effectiveness of the KLI model learning with other more traditional learning models, such as direct and cooperative learning models, to see the advantages and disadvantages of each in improving 21<sup>st</sup>-century skills. This research used an experimental design with a quantitative approach.

The uniqueness of this research lies in its implementation of a learning model that combines Islamic values and local wisdom with a 21<sup>st</sup>-century approach. This research is expected to provide practical recommendations for educators and policymakers on designing more effective learning models that meet the needs of students in the digital era and amid globalization, without ignoring the moral and religious values that are important in Islamic education.

## METHOD

### Experimental design

This research uses an experimental design with a quantitative approach. This design was chosen because it aims to test the effectiveness of the KLI learning model in improving students' 21st-century skills in Islamic elementary schools. In addition, this study also focuses on the comparison between three learning models (A), namely KLI ( $A_1$ ), cooperative learning (CL) model ( $A_2$ ), and direct instruction (DI) model ( $A_3$ ), with the gender variable (B) of learners as a moderator factor, namely male ( $B_1$ ) and female ( $B_2$ ).

Table 1 shows the 2x3 factorial experimental research design that tested two independent variables: learning model and gender. With this design, the study could assess not only the main effects of each variable (learning model and gender) but also their interaction, providing deeper insights into how both factors affect learners' 21<sup>st</sup>-century skills.

Table 1. Factorial Experiment 2x3 Research Design

		Gender (B)	
		Male ( $B_1$ )	Female ( $B_2$ )
Learning Model (A)	KLI ( $A_1$ )	$A_1B_1$	$A_1B_2$
	CL ( $A_2$ )	$A_2B_1$	$A_2B_2$
	DI ( $A_3$ )	$A_3B_1$	$A_3B_2$

### Research Subject

The subjects of this study were learners in Islamic primary schools in Mataram City, with a random sample drawn from integrated Islamic schools. The study involved 174 learners, divided into two main groups: male and female. Each group was subdivided into three experimental groups based on the learning model used: KLI, CL, and DI.

Table 2 shows the distribution of research samples across three treatment groups. The first group, KLI, consists of 58 samples, with equal numbers of males (29) and females (29). The second group, CL, also includes 58 samples, maintaining the same gender distribution of 29 males and 29 females. The third group, DI, has 58 samples, with a slightly higher number of males (30) than females (28). The study involves 174 samples, comprising 88 males and 86 females. The balanced distribution of samples across genders within each treatment group helps ensure fair representation when analyzing the effects of learning models on research outcomes.

Table 2. Distribution of Research Samples

No	Treatment Group	Number of Samples	Gender Distribution
1	KLI	58	29 males and 29 females
2	CL	58	29 males and 29 females
3	DI	58	30 males and 28 females
Total		174	88 males and 86 females

### Treatment Procedure

Table 3 provides a summary of the instructional delivery for each treatment group. It outlines the learning procedures for three treatment classes: KLI, CL, and DI. For each model, the procedure begins with a pre-test, in which students are involved before learning occurs. During the implementation phase, both students and teachers apply the specific syntax of each respective learning model (KLI, CL, DI). After learning, students complete a post-test to assess their progress.

Table 3. Summary of The Instructional Delivery in Each Treatment Group

Learning Model (Treatment Class)	Learning delivery procedure	Elaboration	Implementation Role
KLI	Before Learning	Pre-test	Students
	Implementation of learning model	Syntax of KLI model	Student and teacher
	After Learning	Post-test	Student
CL	Before Learning	Pre-test	Students
	Implementation of learning model	Syntax of CL Model	Student and teacher
	After Learning	Post-test	Student
DI	Before Learning	Pre-test	Students
	Implementation of learning model	Syntax of DI model	Student and teacher
	After Learning	Post-test	Student

### Data Collection and Analysis

Data on 21<sup>st</sup>-century skills were collected using critical thinking tests, creative thinking tests, questionnaires, and observation sheets to assess communication and collaboration skills. The instruments employed were validated by a panel of six experts and deemed valid. The critical thinking test comprised 7 items, while the creative thinking test comprised 5. The questionnaires and observation sheets for communication and collaboration skills contained 10 items.

Data analysis was conducted using descriptive statistics to summarize the key characteristics of the sample and the pre-test and post-test results. This analysis provides an overview of the distribution of 21<sup>st</sup>-century skills scores before and after implementing the learning models. Parametric assumptions, including normality and homogeneity, were assessed before hypothesis testing. The normality of the data was tested using the Kolmogorov-Smirnov test, while the homogeneity of variances was tested using Levene's test. Data analysis was performed using a Two-Way ANOVA to examine the influence of different learning models, gender, and their interaction on 21<sup>st</sup>-century skills. Tukey HSD and LSD tests were conducted post-ANOVA to determine specific group differences. Data analysis was performed using Microsoft Excel 2021 and SPSS version 26.

## RESULTS AND DISCUSSION

### Concept: The KLI Learning Model

The KoPI Lokal Islami (KLI) learning model is one of the models that support 21<sup>st</sup>-century Skills and student character development. The choice of the word KoPI, which is an acronym for Cooperative, Project, and Inquiry. In addition, the philosophy of coffee (*kopi* in

the Indonesian language) also represents a booster that is usually drunk when you want to achieve higher performance. Likewise, in the learning process, combining several learning steps from the integration of cooperative learning models, projects, and inquiry is expected to foster students' critical thinking, creativity, communication, and collaboration skills. To support students' character in implementing the KoPI learning model, local wisdom and Islamic values are inserted (Arizona et al., 2023b).

Table 4 provides a summary and syntax of the described KLI learning model. The KLI learning model has several stages to develop 21<sup>st</sup>-century skills and foster student character. Learning begins with the teacher presenting the objectives, guiding questions, and asking students to formulate hypotheses based on the problem. Next, students are divided into heterogeneous groups and given topics relevant to local wisdom and Islamic values to organize project planning and experimentation. In the project development stage, students plan experiments and collect data according to an agreed-upon method. They then test the hypothesis based on the data obtained and interpret the experiment's results. After that, students present their findings in a report and as a project product. The learning is closed with evaluating student performance based on participation, presentation quality, and understanding of the material, accompanied by providing constructive feedback. This KoPI model integrates cooperative, project, and inquiry approaches to improve students' critical and creative thinking, communication, and collaboration skills while strengthening character by introducing local wisdom and Islamic values in the learning process.

Table 4. Syntax of The KLI Learning Model

No.	Learning Stages	Description	Implementation Role
1	Conveying the Purpose of the Essential Question and Hypothesis	The teacher presents the objectives and leading questions; students formulate hypotheses	Teachers and Students
2	Organize project planning and experimentation	Division of groups and provision of topics relevant to local wisdom and Islam	Teachers and Students
3	Developing Projects & Collecting Data	Project planning, experimentation, and data collection	Students
4	Testing Results & Data Interpretation	Analyze and test hypotheses based on data collected	Students
5	Communicating Projects & Results	Presentation of findings using visual media	Students
6	Evaluation & Reward	Evaluation of student performance and provision of feedback and awards for the best groups	Teachers and Students

The learning model is relevant to learners in Islamic primary schools. This model aims to improve 21<sup>st</sup>-century skills, such as critical thinking, creativity, communication, and collaboration, while introducing moral and spiritual values. Through this approach, students are not only taught academic material but are also directed to understand and apply Islamic values and local wisdom in their daily lives (Ofianto, 2024; Parhan, 2024; Sucilestari et al., 2023b; Susanto et al., 2022). Integrating Islamic aspects and local wisdom in learning makes KLI relevant and holistic in developing 21<sup>st</sup>-century skills in students.

### Descriptive Data Analysis of 21<sup>st</sup>-Century Skills

Table 5 summarizes the descriptive statistics of the 21<sup>st</sup>-century skills pre-test across four models (KLI, CL, DI, and Total) by gender. In the KLI model, males scored an average of 53.33 and females 54.29, with a combined mean of 53.81. In the CL model, males had a mean of 54.04, females had a mean of 55.03, and the overall mean was 54.54. For the DI model, males averaged 52.14, females 53.42, and the total mean was 52.76. Overall, males had a mean of 53.16, females 54.26, and a combined mean of 53.70 across all models. Based on the pre-test results, the learners' 21st-century skills scores in both groups were at the basic level, with little difference between them.

Table 5. Descriptive Statistics of 21st-Century Skills Pre-test

Model	Gender	Mean	Std. Deviation	N
KLI	Male	53.326	6.477	29
	Female	54.295	4.134	29
	Total	53.810	5.408	58
CL	Male	54.041	5.059	29
	Female	55.032	3.864	29
	Total	54.537	4.489	58
DI	Male	52.144	6.224	30
	Female	53.417	5.459	28
	Total	52.759	5.851	58
Total	Male	53.159	5.939	88
	Female	54.258	4.522	86
	Total	53.702	5.300	174

Table 6 summarizes the descriptive statistics of the 21<sup>st</sup>-century skills post-test by model and gender. In the KLI model, males scored an average of 78.10 and females 79.16, with a combined mean of 78.63. In the CL model, males had a mean of 65.95, females had a mean of 67.62, and the total mean was 66.78. For the DI model, males averaged 59.75, and females 62.15, with an overall mean of 60.91. Across all models, males had a mean of 67.84, females had a mean of 69.73, and the total mean was 68.78, based on 174 participants. This indicates that the KLI learning model is better at improving 21<sup>st</sup>-century skills than the cooperative and direct learning models.

Table 6. Descriptive Statistics of 21<sup>st</sup>-Century Skills Post-test

Model	Gender	Mean	Std. Deviation	N
KLI	Male	78.102	4.322	29
	Female	79.159	2.592	29
	Total	78.631	3.572	58
CL	Male	65.949	5.931	29
	Female	67.619	5.765	29
	Total	66.785	5.857	58
DI	Male	59.750	7.209	30
	Female	62.154	5.429	28
	Total	60.911	6.471	58
Total	Male	67.841	9.670	88
	Female	69.732	8.561	86
	Total	68.775	9.162	174

Figure 1 presents the pre-test and post-test scores of 21<sup>st</sup>-century skills across three learning models (KLI, CL, and DI) for four skills: critical thinking, creative thinking, communication, and collaboration. In the critical thinking skill, the KLI model increased from 36.69 to 69.01, CL from 35.96 to 55.22, and DI from 34.48 to 46.06. For Creative Thinking, KLI improved from 23.03 to 57.17, CL from 24.76 to 39.93, and DI from 23.31 to 33.51. In Communication, KLI increased from 75.83 to 93.83, CL from 77.31 to 85.31, and DI from 75.51 to 81.41. Finally, the KLI model showed the most significant improvement in collaboration, rising from 78.48 to 93.51, CL from 78.10 to 84.20, and DI from 76.34 to 81.07. These results indicate that all models yielded substantial gains across the tested skills, with the KLI model achieving the highest post-test scores in most areas.

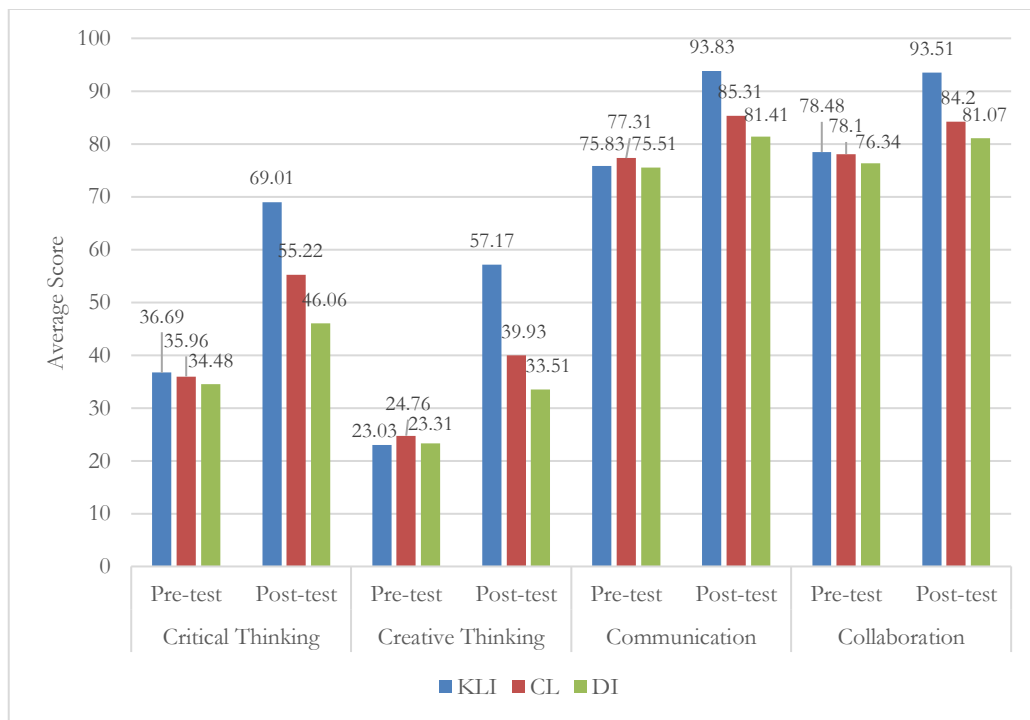
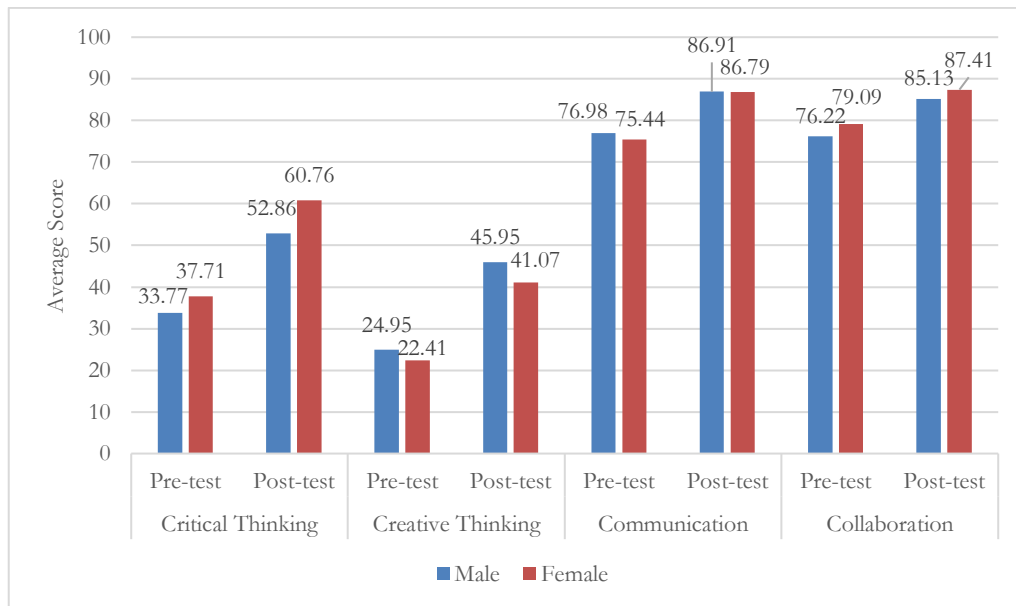


Figure 1. Comparison of Pre-test and Post-test Scores of 21st Century Skills Based on Learning Model

Figure 2 shows the pre-test and post-test scores for 21<sup>st</sup>-century skills categorized by gender. For critical thinking, males improved from 33.77 in the pre-test to 52.86 in the post-test, while females increased from 37.71 to 60.76. In creative thinking, males scored 24.95 in the pre-test and 45.95 in the post-test, while females moved from 22.41 to 41.07. Regarding communication, males improved from 76.98 to 86.91, and females slightly increased from 75.44 to 86.79. Finally, in collaboration, males increased from 76.22 to 85.13, while females improved from 79.09 to 87.41. Overall, both genders showed significant gains across all skills, with females generally outperforming males in most post-test results.

Figure 2. Comparison of Pre-test and Post-test Scores of 21<sup>st</sup>-Century Skills Based on Gender

### Statistical Analysis of 21<sup>st</sup>-Century Skills

Analysis of Normality, Homogeneity, and Hypothesis Tests Using Two-Way ANOVA followed by Tukey HSD and LSD Tests. To ensure the validity of the research results, normality and homogeneity tests were conducted as a requirement for parametric statistical tests. The normality test uses the Kolmogorov-Smirnov test to ensure that the distribution of 21<sup>st</sup>-century skills data follows a normal distribution. Homogeneity test: This test was conducted using Levene's test to test the similarity of variance between groups.

Table 7 presents the results of the Kolmogorov-Smirnov tests for normality conducted on the pre-test and post-test scores of 21<sup>st</sup>-century skills across three learning models (KLI, CL, and DI). The significance values (Sig.) for both the pre-test and post-test scores are 0.200, indicating that the data for all models follow a normal distribution, as the significance levels are greater than the threshold of 0.05. Thus, the normality assumption is satisfied for all models in both pre-test and post-test conditions.

Table 7. Tests of Normality

	Model	Kolmogorov-Smirnov <sup>a</sup>		
		Statistic	df	Sig.
21 <sup>st</sup> -century skills pre-test	KLI	0.083	58	0.200*
	CL	0.070	58	0.200*
	DI	0.089	58	0.200*
21 <sup>st</sup> -century skills post-test	KLI	0.098	58	0.200*
	CL	0.090	58	0.200*
	DI	0.076	58	0.200*

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

Results of Levene's Test for Equality of Error Variances. The test evaluates whether the error variances of the dependent variable are equal across groups. The F-value is 2.027, with



degrees of freedom  $df_1 = 5$  and  $df_2 = 168$ . The significance value (Sig.) is 0.077, which is greater than the threshold of 0.05. This indicates that there is no significant difference in error variances across groups and that the assumption of homogeneity of variances is satisfied.

Table 8 presents the results of the Tests of Between-Subjects Effects. The corrected model is highly significant ( $F = 65.372$ ,  $p = 0.000$ ), indicating that the overall model is effective. The intercept ( $F = 28048.626$ ,  $p = 0.000$ ) and the model ( $F = 160.324$ ,  $p = 0.000$ ) significantly affect the dependent variable. Gender also has a significant effect ( $F = 4.336$ ,  $p = 0.039$ ), while the interaction between model and gender is not significant ( $F = 0.224$ ,  $p = 0.799$ ). The model explains 66.1% of the variance (adjusted R-squared = 0.650). These findings indicate that the model used in the analysis significantly affects the dependent variable.

Furthermore, the findings show that gender also has a significant effect, indicating that gender differences can influence the results of the tested variable. However, the interaction between the model and gender is not significant, indicating that the model's effect on the dependent variable does not differ significantly between the genders tested. To determine specific differences between groups, Tukey HSD and LSD tests were conducted. The test results showed that the KLI group significantly affected 21<sup>st</sup>-century skills compared to the group using CL or DI.

Table 8. Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	9591.132 <sup>a</sup>	5	1918.226	65.372	.000
Intercept	823032.921	1	823032.921	28048.626	.000
Model	9408.786	2	4704.393	160.324	.000
Gender	127.229	1	127.229	4.336	.039
Model * Gender	13.172	2	6.586	.224	.799
Error	4929.636	168	29.343		
Total	837549.567	174			
Corrected Total	14520.768	173			

a. R Squared = .661 (Adjusted R Squared = .650)

Table 9 presents the Bootstrap for Multiple Comparisons analysis results for comparing the mean differences among the three learning models (KLI, CL, and DI) using the Tukey HSD and LSD methods. This comparison aims to evaluate whether there is a significant difference between the models. Overall, the results of this analysis indicate a significant difference in effectiveness among the learning models tested, with the KLI model emerging as the most effective at improving learning outcomes compared to CL and DI.

Table 9. Bootstrap for Multiple Comparisons

	(I) Model	(J) Model	Mean Difference		Bootstrap <sup>a</sup>		
			(I-J)	Bias	Std. Error	95% Confidence Interval Lower	Upper
Tukey HSD	KLI	CL	11.8459	-.0493	.8891	10.0398	13.4249
		DI	17.7201	-.0690	.9547	15.7478	19.5245
	CL	KLI	-11.8459	.0493	.8891	-13.4249	-10.0398
		DI	5.8742	-.0198	1.1269	3.5240	8.1460
	DI	KLI	-17.7201	.0690	.9547	-19.5245	-15.7478
		CL	-5.8742	.0198	1.1269	-8.1460	-3.5240
LSD	KLI	CL	11.8459	-.0493	.8891	10.0398	13.4249
		DI	17.7201	-.0690	.9547	15.7478	19.5245
	CL	KLI	-11.8459	.0493	.8891	-13.4249	-10.0398
		DI	5.8742	-.0198	1.1269	3.5240	8.1460
	DI	KLI	-17.7201	.0690	.9547	-19.5245	-15.7478
		CL	-5.8742	.0198	1.1269	-8.1460	-3.5240

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

Table 10 presents the results of the Tukey HSD test for homogeneous subsets. The table shows that three subsets were identified based on the models' observed means. The KLI learning model has the highest mean (78.6307) and is significantly different from CL (66.7848) and DI (60.9106). CL and DI were each in a different group, with significant mean differences, even though they were grouped into two different subsets.

Table 10. Homogeneous Subsets

	Model	N	Subset		
			1	2	3
Tukey HSD <sup>a,b</sup>	DI	58	60.9106		
	CL	58		66.7848	
	KLI	58			78.6307
	Sig.		1.000	1.000	1.000

Means for groups in homogeneous subsets are displayed.

Based on observed means.

The error term is Mean Squared (Error) = 29.343.

a. Uses Harmonic Mean Sample Size = 58.000.

b. Alpha = 0.05.

This study aims to explore and analyze the effectiveness of the KLI learning model in improving 21<sup>st</sup>-century skills in Islamic primary school learners. The main findings of this study show that the KLI model has a more significant influence on improving critical thinking, creative, communication, and collaboration skills compared to cooperative learning and direct learning models. This comparison provides a clear picture of the potential of the KLI model to integrate 21<sup>st</sup>-century skills with Islamic values and local wisdom that characterize Islamic

education (Arizona et al., 2023a; Arizona et al., 2023b; Nawawi, 2024; Thornhill-Miller et al., 2023).

One of the key findings was a more significant improvement in critical thinking skills and creativity among learners who followed the KLI model. This aligns with previous research emphasizing the importance of developing critical and creative thinking skills in 21<sup>st</sup>-century education. For example, several previous studies highlighted that project-based learning and inquiry, which are part of the KLI model, can effectively improve learners' critical thinking skills and creativity (Asyari et al., 2024; Chen & Chen, 2021; Eliaumra et al., 2024). The KLI model provides opportunities for students to engage in activities that require them to analyze problems, plan solutions, and work collaboratively to find answers, which encourages the development of critical and creative thinking skills.

In addition, the higher improvement in communication and collaboration skills in the group using the KLI model confirms previous findings on the importance of cooperative learning in developing learners' social skills. Collaboration in the context of 21<sup>st</sup>-century education can enrich students' learning experience, allowing them to learn more holistically (Love et al., 2023). The KLI model, which combines cooperative learning and projects, creates an environment that supports collaboration between students. In this case, students not only learn from the teacher's teaching but also through interaction and discussion with their classmates, which plays a vital role in building communication and collaboration skills (Asyari et al., 2024; Thornhill-Miller et al., 2023).

The comparison between the KLI model and cooperative and direct learning models also provides deeper insights into the KLI model's superiority in enhancing 21<sup>st</sup>-century skills. While cooperative and direct learning models have been proven effective in specific contexts, the KLI model integrates more active, contextually relevant learning elements that are relevant to learners' lives. Unlike the cooperative model, which focuses more on group work, or the direct learning model, which focuses on instruction-based teaching, the KLI model integrates all three cooperative, project, and inquiry to provide a more profound and more sustainable learning experience for students (Gómez & Suárez, 2020; Gunawan et al., 2020, 2021; Rehman et al., 2023).

Although the KLI model shows better results in improving 21<sup>st</sup>-century skills, the main challenge faced by Islamic primary schools is to integrate this model effectively into daily practice. Although many Islamic primary schools have attempted to adopt cooperative, inquiry, and project-based learning, there are still gaps in the application of Islamic values and local wisdom in learning (Sucilestari et al., 2023a; Sucilestari et al., 2023b). This research found that one of the strengths of the KLI learning model lies in its ability to combine modern approaches with local religious and cultural values, which contributes to strengthening students' character. However, implementation challenges remain, especially regarding teacher training and the provision of adequate resources to support value-based learning (Arizona et al., 2023a; Kumar & Tissenbaum, 2022; Sakti et al., 2024).

Furthermore, the findings regarding the influence of gender on 21<sup>st</sup>-century skills show that men tend to excel in critical thinking skills while women excel in collaboration skills. These results are consistent with previous research, which found differences in the achievement of 21<sup>st</sup>-century skills between men and women, depending on the learning model applied. This study confirms that gender factors can influence how students respond to learning models, highlighting the need to consider these factors in lesson design to ensure that all students, regardless of gender, can develop optimally (Blazquez-Merino et al., 2019; Gao et al., 2023; Hadyaoui & Cheniti-Belcadhi, 2024; Saad et al., 2024).

## CONCLUSION

This study concludes that the KLI learning model significantly enhances 21<sup>st</sup>-century skills in students ( $p=0.000$ ), outperforming the CL and DI models. The KLI model fosters more contextual and meaningful learning experiences, making it more effective in developing critical 21<sup>st</sup>-century skills. Additionally, gender differences were found to influence the development of these skills ( $p=0.039$ ), with female students generally showing a stronger focus on 21<sup>st</sup>-century skills at the primary school level. However, the interaction between the learning model and gender did not significantly affect 21<sup>st</sup>-century skills ( $p=0.799$ ), suggesting that these two factors independently influence students' skill development.

Based on the findings, it is recommended that the KLI learning model be integrated into the curriculum of Islamic elementary schools to better meet the evolving demands of modern education. Educators should be aware of gender-based differences in skill development and tailor their teaching strategies accordingly to support both male and female students in developing 21<sup>st</sup>-century skills. Further research could explore other potential factors, such as socio-economic background or teaching experience, to identify additional variables that may influence the effectiveness of learning models in developing 21<sup>st</sup>-century skills. Additionally, educational policymakers should consider promoting learning models that foster contextual, meaningful learning experiences as a foundation for future educational reforms.

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