International Conference on Teaching and Learning Proceeding
Faculty of Education and Teacher Training – Universitas Terbuka
UTCC, South Tangerang, Banten, May 13th, 2026
Volume 4, pg. 334 – 347
ISSN: 3046-594X

THE SELF CONCEPT OF ELEMENTARY SCHOOL STUDENTS IN LEARNING MATERIALS THROUGH 4C-BASED PROBLEM-BASED LEARNING

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Abstract: This study was conducted due to the importance of developing affective aspects, particulary self-concept, in mathematics learning which has received little attention. This study aims to analyze the influence of 4C-based Problem-Based Learning model on the self-concept of Madrasah Ibtidaiyah students in geometry subject. This study employs a quantitative research with a pretest-posttest control group design, involving 50 fourth-grade students from MIN 1 Bireuen, which were grouped into a 4C-based PBL experimental group and a PBL control group without the 4C approach. The research instruments are a self-concept questionnaire and post-test questions, both of which had undergone validity and reliability testing. The results of the study indicate a significant difference between the two groups in both learning outcomes and self-concept. The experimental group obtained an average post-test score of 82.19 and a self-concept score of 83.95, which were higher than those of the control group. The t-test results revealed a statistically significant difference ($p < 0.05$). Therefore, the 4C-based Problem-Based Learning (PBL) model is effective in improving students' self-concept and learning outcomes in geometry. This study implies that integrating 21st-century skills into mathematics instruction can enhance students' self-confidence, independence, and collaborative abilities.

Keywords: 4C Skills; Self-Concept; Geometry Learning; Elementary Students

Accepted: 12 May 2026 Approved: 12 June 2026 Published: 29 Juni 2026

INTRODUCTION

Geometry is frequently regarded as a complex domain within mathematics education, as it requires the ability to comprehend planar and spatial concepts through measurable and directly observable relationships among objects. This complexity often constitutes a barrier for students in solving geometric problems, both in academic settings and in everyday contexts. Consequently, many students experience a lack of confidence, which contributes to a low self-concept regarding their mathematical abilities. In general, fourth-grade students in Madrasah Ibtidaiyah encounter difficulties in conceptual, procedural, principled, and skill-based aspects when studying geometry. These difficulties may arise from both cognitive and

affective factors, one of which is students' self-concept in relation to mathematics. The limited mathematical proficiency of Madrasah Ibtidaiyah students contributes to their low self-concept, particularly in the context of learning geometry. This condition represents a significant concern that requires immediate attention from educators.

According to Awado T. M (2024), a supportive teaching style promotes positive attitudes and enhances students' mathematical self-concept, which ultimately contributes to improved learning

outcomes. However, this is difficult to achieve when instruction continues to rely on approaches that are insufficiently interactive and lack contextual relevance. As a result, students often struggle to relate geometric concepts to real-life experiences, leading to decreased motivation and a lack of confidence in solving problems. Such a negative self-concept may impede students' willingness to learn and negatively affect their academic achievement. Therefore, mathematics teachers need to continuously innovate in selecting effective instructional approaches (Dina et al., 2019; Palinussa et al., 2021; Setiyani et al., 2020).

Mathematics education is fundamentally aimed at developing students' creative, critical, rational, and analytical thinking skills, as well as promoting their ability to collaborate in solving real-life problems. Nevertheless, classroom practices continue to emphasize the transmission of theoretical knowledge, the use of worked examples, and repetitive exercises (Ikhsan et al., 2020; Pulungan et al., 2022; Yaniawati et al., 2019). This approach is often viewed as insufficient for supporting the development of students' thinking skills and deepening their conceptual understanding of mathematics (Ricoy & Sánchez-Martínez, 2023; Syaiful et al., 2021).

Recent research findings confirm that students' success in learning geometry is strongly influenced by both cognitive and affective factors. Understanding of concepts, procedures, principles, and mathematical skills forms an essential foundation that students must possess, alongside self-concept, which reflects their confidence and belief in their own abilities. Meisya and Wandini (2023) found that self-efficacy plays a major role in determining geometry learning outcomes, where students with higher self-efficacy tend to achieve better academic performance. In the context of modern learning, the use of interactive media such as GeoGebra has been shown to effectively support students in developing broader ways of thinking while also strengthening their self-concept. Junaidi and Taufiq (2023) reported that contextual learning assisted by GeoGebra not only improves creative thinking skills but also enhances students' positive perceptions of mathematics. Therefore, teachers need to adopt instructional approaches that are interactive, contextual, and realistic so that students can connect geometric concepts with real-life situations. Liu and Chen (2024) highlighted that low conceptual understanding, high mathematics anxiety, cognitive barriers, inappropriate teaching methods, and socio-cultural factors are among the main causes of difficulties in learning mathematics. Similarly, Nazish (2024) stated that unsuitable instructional

Volume 4, pg. 334 – 347
ISSN: 3046-594X

approaches and irrelevant assessment practices further worsen these problems. In general, compared to other subjects, mathematics remains one of the areas that most frequently triggers anxiety among primary school students. Winata et al. (2025) also reported that many students experience conceptual misconceptions, high levels of anxiety, and weaknesses in metacognitive strategies.

Students' self-concept in mathematics plays an important psychological role that influences their motivation, self-confidence, and attitudes in facing various learning challenges. Findings from Andhini et al. (2023) show that students with a positive self-concept demonstrate better ability in understanding mathematical concepts compared to those with a negative self-concept. Furthermore, Kurniawan et al. (2024) emphasize that students with a positive self-concept are able to achieve all indicators of mathematical connection ability optimally, whereas students with a negative self-concept tend to experience difficulties in this regard. In reality, many Madrasah Ibtidaiyah students still have a low level of self-concept toward mathematics, particularly in geometry topics that require both conceptual and procedural understanding. Therefore, the implementation of appropriate instructional models accompanied by the strengthening of positive self-concept, as suggested by Afifah et al. (2023), can help students more easily understand and communicate mathematical ideas effectively.

To address these issues, an instructional approach is needed that not only strengthens students' self-concept but also helps them develop a deeper understanding of mathematical concepts. One relevant alternative is the implementation of a 4C-based Problem-Based Learning (PBL) model. Several studies, such as those conducted by Awalia (2023) and Istiqomah et al. (2025), have reported that the application of PBL and students' self-confidence has a positive effect on mathematical problem-solving abilities. The 4C-based PBL model emphasizes student-centered learning activities, encouraging students to actively seek solutions to real-world problems. Through this process, students not only gain a clearer understanding of concepts but also develop confidence and the willingness to attempt problem-solving without fear of making mistakes. Therefore, 4C-based PBL is considered an effective approach for fostering higher-order thinking skills and supporting the improvement of mathematics learning quality at the primary school level.

A number of studies suggest that the implementation of Problem-Based Learning (PBL) is an effective approach to improving the quality of mathematics instruction at the primary school level. A meta-analysis conducted by Suparman et al. (2021) reported that the PBL model has a significant positive effect on students' learning outcomes as well as their attitudes toward mathematics. These findings indicate that students' active involvement in solving contextual problems not only strengthens their conceptual understanding but also increases their interest in learning. Research by Erdem (2024) further supports these results, showing that the application of PBL can enhance students' critical thinking and problem-solving skills. However, variations in its impact on academic achievement have been observed, depending on the context of implementation and student characteristics. Another

study by Muliawati (2024) reported that PBL contributes significantly to improving mathematics learning outcomes among Madrasah Ibtidaiyah students. Meanwhile, Nurhasanah (2024) revealed that integrating PBL with interactive learning media can strengthen mathematical problem-solving skills while also promoting positive traits such as responsibility, independence, and collaboration among students.

Overall, these findings indicate that PBL has considerable potential to improve both the quality of the learning process and students' learning outcomes in mathematics at the primary school level. However, most previous studies have primarily focused on the development of cognitive abilities, such as conceptual understanding and mathematical problem-solving (Dina et al., 2019; Setiyani et al., 2020; Ikhsan et al., 2020), while the affective domain, particularly students' self-concept in mathematics, has received relatively limited attention. At the same time, 21st-century learning requires the mastery of 4C skills, including critical thinking, creativity, collaboration, and communication. Nevertheless, the integration of 4C aspects within PBL in prior studies has largely been confined to strengthening critical and creative thinking, and has not yet extended to the development of a positive self-concept.

Moreover, research examining the implementation of 4C-based PBL in Madrasah Ibtidaiyah remains limited, even though this educational context places strong emphasis on balancing cognitive and affective development, which is important for developing students' positive self-concept. Geometry, which requires spatial understanding and visualization, is also less frequently studied from an affective perspective, as research at the primary level more often focuses on arithmetic. This condition is further influenced by classroom practices that still rely on conventional methods, limiting opportunities for students to collaborate and actively explore ideas. Therefore, empirical research is needed to examine the effect of a 4C-based PBL model on students' self-concept in learning geometry at the Madrasah Ibtidaiyah level. It is expected that this study will help address gaps in previous research and provide both theoretical insight and practical guidance for the development of mathematics instruction that aligns with the demands of 21st-century learning.

The distinctive contribution of this study lies in the implementation of a 4C-based Problem-Based Learning (PBL) model, which is not only oriented toward improving students' cognitive abilities but is also designed to develop affective aspects, particularly students' self-concept, in the context of geometry learning at the Madrasah Ibtidaiyah level. In contrast to most previous studies that primarily focus on the impact of PBL on learning outcomes or mathematical problem-solving abilities, this study specifically integrates 21st-century skills, including critical thinking, communication, collaboration, and creativity, into the geometry learning process to support the development of a positive self-concept among students.

In addition, this study provides a new empirical contribution, as it is conducted at the Madrasah Ibtidaiyah level, which has rarely been the focus of research on the integration of 4C-based PBL with the development of affective aspects. A methodological contribution is also reflected in the development of a self-concept instrument specifically designed to align

with the characteristics of primary school students, including indicators such as self-confidence, self-acceptance, self-esteem, independence, and the ability to engage in positive social interactions. Through this study, the discussion of mathematics learning is extended beyond a primary focus on cognitive aspects to also include the affective domain, which plays an important role in strengthening students' confidence and promoting positive attitudes toward mathematics.

This article aims to examine the effect of implementing a 4C-based Problem-Based Learning (PBL) model on the self-concept of Madrasah Ibtidaiyah students in learning geometry. This study is expected to contribute both theoretically and practically to improving the quality of mathematics instruction in Madrasah Ibtidaiyah. From a theoretical perspective, the findings are expected to expand understanding of the relationship between instructional models, 21st-century skills, and students' self-concept. From a practical perspective, the results can serve as a reference for teachers in developing more effective instructional strategies to promote positive self-concept and deepen students' understanding of mathematical concepts.

By implementing an appropriate instructional approach, a learning environment that supports the development of students' positive self-concept in mathematics, particularly in geometry, is expected to be established. Such an approach not only contributes to improved learning outcomes but also encourages the development of positive attitudes, effective thinking habits, and essential skills that can support students' success both academically and in their future lives.

Research Questions

Is there an effect of the 4C-based Problem-Based Learning (PBL) model on Madrasah Ibtidaiyah (MI) students' self-concept in learning geometry?

Is there a significant difference in students' self-concept between those who are taught using the 4C-based PBL model and those who are taught using the PBL model without 4C integration?

Research Hypotheses

Null Hypothesis (H_0)**:** There is no significant difference in MI students' self-concept in learning geometry between those taught using the 4C-based PBL model and those taught using the PBL model without 4C integration.

Alternative Hypothesis (H_1)**:** There is a significant difference in MI students' self-concept in learning geometry between those taught using the 4C-based PBL model and those taught using the PBL model without 4C integration.

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Research Method

A quantitative approach was employed in this study, as it enables the researcher to assess the effect of the treatment on the research variable, namely students' self-concept, in a measurable manner. The study adopted a pretest–posttest control group design, involving two groups: an experimental group that received instruction through a 4C-based Problem-Based Learning (PBL) model, and a control group that was taught using a PBL model without 4C integration. The population comprised all fourth-grade students at Madrasah Ibtidaiyah Negeri 1 Bireuen, consisting of four parallel classes with a total of 98 students. From this population, 50 students were selected as the sample and assigned to two parallel classes. The sampling technique used was purposive sampling, a non-random method based on the consideration of comparable academic ability between the experimental and control groups, as indicated by their prior learning outcomes. Based on these criteria, Class IV-A was designated as the experimental group, while Class IV-B served as the control group, with each class consisting of 25 students.

To obtain accurate and comprehensive data, several data collection methods were employed, including interviews, classroom experiments, questionnaire administration, and post-testing. Following the implementation of the treatment, the research outcomes were measured using a self-concept questionnaire and post-test items. The questionnaire instrument used in this study had undergone validity and reliability testing to ensure the accuracy and consistency of the measurements. The entire research process was conducted in the fourth grade at MIN 1 Bireuen Aceh.

After the learning process is completed, a post-test is conducted on each group to measure the results of the given treatment. Afterwards, the researchers distribute a self-concept questionnaire to all research participants, both from the experimental classes and control classes, to obtain data on students' self-perception. If required, additional interviews are also conducted to reinforce the field findings. Data analysis is performed through the descriptive and inferential statistical approaches. The data from test results are first tested for normality and homogeneity as prerequisites before the t-test is used. If the data fulfil the assumptions of normality and homogeneity, then the t-test is used, whereas if they do not, an appropriate alternative test is used. Hypothesis testing is conducted with a two-tailed t-test (independent sample t-test) to determine whether there is a significant difference between the experimental group and the control group. The significance level is based on the value $p < 0.05$, which shows there is a significant influence if the criterion is met. Furthermore, to identify the relationship between self-concept and students' ability, product moment correlation analysis is used, to measure the level of linear correlation between these two quantitative variables.

RESULT AND DISCUSSION

In this research, data collection was conducted through a final test (post-test) to measure the students' learning result. The experimental class was taught with 4C-based Problem-Based Learning model, while the control class was taught with PBL model without 4C integration. Each class consisted of 25 students who worked on five essay questions on the area and perimeter of two-dimensional shapes for fourth-grade students of Madrasah Ibtidaiyah. Additionally, data regarding students' self-concept were obtained through the distribution of questionnaires to all participants from both classes. The questionnaire instrument was

developed based on the indicators of self-concept relevant to the context of mathematics learning in elementary school. The self-concept indicators used in this research is presented in the following table.

The self-concept indicators developed for the questionnaire: self-confidence, self-acceptance, self-esteem, independence, and positive social interaction.

Data Normality Analysis (Kolmogorov-Smirnov Test)

According to data from 25 students of each group (experimental and control), a Kolmogorov-Smirnov (K-S Test) normality test was conducted for four variables:

Experimental Post-test

Experimental Self-Concept

Control Post-test

Control Self-Concept

Descriptive Statistics for Each Variable

Table 3. Analysis Results: Mean, Standard Deviation, Minimum and Maximum Value

Variable	Mean	SD	Min	Max
Experimental Post-test	82.19	5.89	71.4	92.9
Experimental Self-Concept	83.95	5.30	74.4	96.2
Control Post-test	77.14	6.86	58.2	87.3
Control Self-Concept	77.50	5.31	64.0	88.4

Before conducting inferential analysis, the researchers first conducted a data normality test using the Kolmogorov-Smirnov test. The results of Kolmogorov-Smirnov normality test for the four data groups are presented in the following table:

Table 4. Normality test results for the four variables

Variable	Mean	SD	KS Statistics	p-value	Normality conclusion
Experimental Post-test	82.19	5.89	0.0963	0.9573	(p > 0.05) normal
Experimental Self-Concept	83.95	5.30	0.0794	0.9937	(p > 0.05) normal
Control Post-test	77.14	6.86	0.1043	0.9225	(p > 0.05) normal
Control Self-Concept	77.50	5.31	0.1130	0.8716	(p > 0.05) normal

The results of normality test indicated that the four variables: the experimental post-test scores, experimental self-concept, control post-test scores, and control self-concept, have p-values > 0.05, which means the data are normally distributed (p-values above 0.05). This implies that data for the four variables are normally distributed. Normal distribution is one of the prerequisites that must be fulfilled for the use of parametric tests, including the independent two sample t-test used in this study. This result indicated that the normality assumptions is fulfilled, allowing the analysis to proceed to the next stage.

Homogeneity of variance testing using Levene's Test was conducted to ensure that the variances between groups were equal. The following are the homogeneity test results using Levene's Test. Data were obtained from two groups: experimental and control groups. The tested variables were post-test scores and self-concept scores from each group. The Levene's Test procedures were used to examine whether the variances of the two data groups were equal (homogeneous)

Null hypothesis (H_0): The variances of the two groups are equal (homogeneous)

Alternative hypothesis (H_1): The variances of the two groups are different (non-homogeneous)

If the p-value > 0.05, then H_0 is accepted, which means that the data are homogeneous

Table 5. Homogeneity Test Results for the Two Variables

Variable	**Levene Statistics**	**p-value**	**Homogeneity Conclusion**
Post-test	0.577	0.451	Homogeneous (p > 0.05)
Self-Concept	0.060	0.807	Homogeneous (p > 0.05)

The homogeneity test results indicated that both the post-test data and the self-concept data showed a significance value (p-value) above 0.05. On the post-test variable, the p-value is 0.451, indicating the variances between the experimental and control groups were

homogeneous. For the self-concept variable, the p-value = 0.807, also indicating homogeneous variances. Therefore, it can be concluded that the data from both groups (experimental and control) have homogeneous variances. This reinforced the basis for choosing the independent two-sample t-test under the assumption of equal variances. This homogeneity test is important prior to conducting the t-test, as one of the t-test assumptions is that the data originates from a population with equal variances.

After fulfilling the assumptions of normality and homogeneity, an independent two-sample t-test was conducted to determine whether there was a significant difference between the experimental group and the control group.

Statistical Calculations for the Two-Sample Independent t-test

Hypothesis formulation for the post-test variable:

H_0: There is no significant difference in post-test scores between students who used 4C-based PBL and students who used PBL without 4C.

H_1: There is a significant difference in post-test scores between students who used 4C-based PBL and students who used PBL without 4C.

Hypothesis formulation for the Self-concept variable:

H_0: There is no significant difference in self-concept between students who used 4C-based PBL and students who did not.

H_1: There is a significant difference in self-concept between the experimental group and the control group.

Two-Sample Independent t-test

The analysis began by finding the t-value using the formula:

$\bar{X}_1, \bar{X}_2$= the mean of each group

$S_P^2{}_p$ = the combined variances

n_1, n_2 = sample sizes of each group, which are 25 from each group

Degree of Freedom: df=n1+n2−2=48df = n_1 + n_2 - 2 = 48

t_{table} (two-tailed) with α = 0.05 two-tailed → t_{table}=2.011 t_{table} = 2.011

t-test for post-test scores

Experimental: $\bar{X}_1$ = 82.19, SD_1 = 5.89

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Control: $\bar{X}_2$= 77.14, SD_2 = 6.86

t-calculated formula:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{s_p^2\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}} \quad t = \frac{82.19 - 77.14}{\sqrt{\frac{(5.89)^2}{25} + \frac{(6.86)^2}{25}}} = \frac{5.05}{\sqrt{\frac{34.6921}{25} + \frac{47.0596}{25}}} = \frac{5.05}{\sqrt{1.3877 + 1.8824}} = \frac{5.05}{\sqrt{3.2701}} = \frac{5.05}{1.8094} \approx 2.79$$

Result:

$t_{\text{-calculated}}$ = 2.79

$t_{\text{-}table}$= 2.011

As $t_{\text{-}calculated} > t_{\text{-}table}$, then H_0 was dismissed, H_1 accepted.

2. t-test for Self-Concept

Experimental: $\bar{X}_1$ = 83.95, SD1=5.30

Control: $\bar{X}_2$ = 77.50, SD2 = 5.31

$$t = \frac{83.95 - 77.50}{\sqrt{\frac{(5.30)^2}{25} + \frac{(5.31)^2}{25}}} = \frac{6.45}{\sqrt{\frac{28.09}{25} + \frac{28.1961}{25}}} = \frac{6.45}{\sqrt{1.1236 + 1.1278}} = \frac{6.45}{\sqrt{2.2514}} = \frac{6.45}{1.5005} \approx 4.30$$

Result:

$t_{\text{-}calculated}$ = 4.30 dan $t_{\text{-}table}$ = 2.011

As $t_{\text{-}calculated} > t_{\text{-}table,}$ then H_0 was dismissed, H_1 accepted.

Table 6. t-test Result Analysis

Variable	t-calculated	t_{table} (α = 0.05, d = 48)	p-value	Decision ($t_{\text{-}hitung} > t_{\text{-}tabel}$)	Hypothesis Conclusion
Post-test Score	2.79	2.011	0.00749	Yes	Significant, H_0 was dismissed
Self-Concept	4.30	2.011	0.000084	Yes	Significant, H_0 was dismissed

t-test results showed that statistically, there was a significant difference in post-test geometry score, the t-calculated value = 2.79 and the t_{table} value = 2.011 at a significance level of 0.05 and degree of freedom 48. As $t_{\text{-calculated}} > t_{\text{-table,}}$ then there was a significant difference between the post-test scores of students in the experimental group and the control group. For self-concept variable, a $t_{\text{-calculated}}$ value of 4.3 was obtained, which was also higher than the $t_{\text{-table}}$ value of 2.011. Therefore, it can be concluded that there was a significant difference in self-

concept between the two groups. These results indicated that the implementation of 4C-based Problem-Based Learning model has a significant influence in the improvement of learning outcomes and the development of students' self-concept in geometry.

DISCUSSION

The data analysis result reveals that the implementation of 4C-based Problem-Based Learning model provides a significant influence in the improvement of self-concept and students' learning outcomes in geometry. Based on the independent t-test, there is a significant difference between the experimental group and the control group, in terms of both post-test scores and self-concept scores. The significance values obtained were $p = 0.00749$ for the post-test and $p = 0.000084$ for the self-concept. Comparison between the $t_{calculated}$ value and the t_{table} value shows that $t_{calculated}$ is higher, thus the null hypothesis was dismissed and the alternative hypothesis accepted.

The implementation of 4C-based PBL, which integrates critical thinking ability, communication, collaboration, and creativity is proven to encourage students to participate more actively in learning. In addition to work together in solving contextual problems, students also reflect on their own roles and abilities. These activities provide a positive impact on the development of better self-perception in overcoming challenges in mathematics learning.

The increase of self-concept scores of the experimental groups also show that the implementation of this model not only influences the cognitive aspects, but also enhances the students' affective dimensions, especially in terms of self-confidence, independence, and social interaction skills. These findings align with the findings Afifah et al. (2023) and Awalia (2023), who state that participatory and contextual learning approaches can build students' self-confidence and promote students' emotional engagement in the process of mathematics learning.

Therefore, the implementation of problem-based learning developed through the 4C approach is able to create a collaborative, explorative learning environment which focuses on building the students' learning identities. This approach becomes crucial in preparing the 21st century students who not only excel at academic skills, but also exhibit independent, adaptive, and highly competitive characters. The distinctive feature of this study lies in the implementation of Problem-based Learning model integrated with the 21st century skills (4C: Critical Thinking, Communication, Collaboration, dan Creativity) to develop the affective aspects of self-concept among Madrasah Ibtidaiyah students in geometry learning. In contrast to the previous studies (Dina et al., 2019; Ikhsan et al., 2020; Setiyani et al., 2020) which emphasize on improving cognitive abilities such as conceptual understanding or problem solving, this study places self-concept as the main variable which is empirically analyzed in the context of 4C-based PBL implementation.

These new findings show that the 4C-based PBL implementation not only has an impact in cognitive achievements, but also strengthens the sudents' affective domain, particularly in terms of building self-confidence, self-acceptance, independence and the ability to interact more positively with peers. This suggests that learning approach which emphasizes on collaboration, communication, and creativity is capable of fostering positive self-perception of students' mathematical abilities, especially in geometry which demands conceptual understanding. This finding aligns with the study results of Taspiah (2021), Abdillah (2023), and Tabroni et al. (2022) which show the improvement in learning outcomes, critical thinking abilities, and problem-solving skills after the implementation of PBL at the Madrasah Ibtidaiyah level.

Additionally, this study also offers methodological innovation through a formulation of self-concept instrument designed specifically for the psychological character of Madrasah Ibtidaiyah students. This instrument consists of five main indicators: self-confidence, self-acceptance, self-esteem, independence, and positive social interaction. The analysis result indicate that all five aspects saw a significant improvement after the implementation of 4C-based PBL, thereby affirming the effectiveness of this approach in comprehensively developing students' affective potential. Thus, the innovation of this study can be elaborated into three main dimensions. (1) from a theoretical perspective, this study expands the function of Problem-Based Learning (PBL) which was initially implemented mainly to improve cognitive aspect, to also serve as a means of developing students' affective aspect; (2) empirically, this study provides evidence through quantitative data, showing that the integration of 4C skills in PBL is proven to be effective in strengthening the self-concept of Madrasah Ibtidaiyah students' in geometry learning. (3) from a practical perspective, the result of this study yield more applicative recommendation for teachers in designing mathematics lessons that are more contextual, collaborative, and focusing on character development, as well as the development of students' positive self-concept. Overall, these findings emphasize that the 4C-based PBL implementation does not only improve students' self-concept, but also provides new contribution to the development of mathematics teaching practices in madrasah ibtidaiyah.

CONCLUSION

Based on the result of the study, it can be concluded that there is a significant influence from the implementation of 4C-based Problem-Based Learning on the improvement of students' self-concept in geometry at Madrasah Ibtidaiyah. In addition, there is a significant difference in self-concept between students in the 4C-based PBL group and students in the PBL group without 4C. Consequently, the proposed research hypotheses are accepted. The implementation of this model is also proven to develop 21st century skills, as well as developing students' positive attitude in mathematics learning. Therefore, 4C-based PBL model is recommended to be used in mathematics learning of elementary school.

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