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Media Quizizz-Based Learning Media Using Lubuklinggau Tourism Context to Improve Students' Understanding of Mathematical Concepts

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ABSTRACT

Understanding mathematical concepts is a fundamental ability that students need in order to explain, connect, and apply them in various situations. However, students still experience difficulties in linking the concepts of flat-sided three-dimensional shapes, specifically prisms and pyramids, to contextual problems. This study aims to analyze changes in students' understanding of mathematical concepts before and after learning using the Indonesian Realistic Mathematics Education (PMRI) approach assisted by Quizizz in the context of Lubuklinggau tourism. The study used a quantitative approach with a pre-experimental one-group pretest-posttest design. The study population consisted of 142 eighth-grade students at SMPIT An-Nida Lubuklinggau in the 2025/2026 academic year, with a sample of 29 students from class VIII.3. The research instrument was a set of five essay questions developed based on six indicators of conceptual understanding. The instrument had been tested for validity and reliability. The learning process integrated PMRI, Quizizz, and Student Worksheets (LKPD) using the context of Watervang and Bukit Sulap on prism and pyramid topics. Data were analyzed using descriptive statistics, normality tests, and the Wilcoxon signed-rank test at a significance level of 5%. The mean conceptual understanding score increased from 32.06 on the pretest to 48.27 on the posttest, with a difference of 16.21 points. The Wilcoxon signed-rank test results showed a significant difference between pretest and posttest scores ($Z = 3.29$; $p < 0.001$). These findings indicate that Quizizz-assisted PMRI learning with the context of Lubuklinggau tourism has the potential to support students' understanding of mathematical concepts in topics on prisms and pyramids.

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Introduction

The development of digital technology opens up opportunities for the development of more interactive mathematics learning media, one of which is through the Quizizz application. Quizizz can be used to present material, stimulus questions, exercises, and interactive evaluations, thereby potentially increasing student engagement in the learning process. Kandaga (2024) reported that learning assisted by the Quizizz application can support the improvement of students' ability to understand mathematical concepts. Wulandari et al. (2023) also developed Quizizz-based mathematics learning assessment tools to support students' conceptual understanding. These findings indicate that Quizizz has potential as a learning medium, but its effectiveness will be more optimal if the material presented within it is linked to a context that is meaningful to students.

One way to present a meaningful context is to utilize local tourism objects as the background for presenting material in learning media. Lubuklinggau has tourist attractions such as Watervang and Bukit Sulap that can be associated with mathematical shapes, elements, measurements, and problems, so that the material presented through Quizizz does not stand alone as abstract problems, but is framed in situations close to students experiences. Adha et al. (2024) showed that the tourism context of Bukit Sulap can be used in mathematics learning regarding the surface area concept. Sukasno et al. (2024) also showed that the context of Watervang Dam can be utilized in mathematics learning design. Thus, the context of Lubuklinggau tourism serves as a bridge connecting mathematical content within Quizizz media with students' real-life experiences, in line with the principles of Indonesian Realistic Mathematics Education (PMRI) which places contextual problems as an important part of learning. Research by Palengka et al. (2024) shows that the application of Realistic Mathematics Education can support the improvement of students understanding of geometry concepts, and Gulo et al. (2024) showed that this approach can be used as an alternative in mathematics learning to support students' mathematical abilities.

Quizizz-based learning media with this tourism context is directed to support students' understanding of mathematical concepts, especially in flat-sided 3D shapes (prisms and pyramids). Understanding concepts in this material is not adequately measured merely by the ability to memorize formulas, but includes the ability to explain the meaning of concepts, classify objects, represent ideas, apply concepts, and connect elements of 3D shapes. Halawa et al. (2025) showed that the ability to understand mathematical concepts is an important aspect to consider in mathematics learning, and Syaifar et al. (2022) showed that conceptual understanding in flat-sided 3D shapes needs attention because students can experience difficulties in understanding concepts related to the material. These difficulties often arise when students only master procedures without understanding the reasons for using formulas or the relationship between the information in the problem and the relevant mathematical concept—an issue expected to be minimized through contextual and interactive material presentation.

Research on Quizizz, tourism contexts, and PMRI has mostly been conducted separately. The development and application of Quizizz-based learning media specifically incorporating the Lubuklinggau tourism context (Watervang and Bukit Sulap) to support the understanding of mathematical concepts on prism and pyramid topics still needs to be studied. This study uses Quizizz media designed with the Lubuklinggau tourism context, combined with the PMRI approach and LKPD activities, to help students connect mathematical content with situations close to their experiences. Based on this description, this study aims to determine differences in the mathematical conceptual understanding ability of class VIII students at SMPIT An-Nida Lubuklinggau before and after the implementation of Quizizz-based learning media with the Lubuklinggau tourism context on prism and pyramid topics. The research question posed is: is

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there a difference in students' mathematical conceptual understanding ability before and after the implementation of Quizizz-based learning media with the Lubuklinggau tourism context?

Method

Research Design

This study uses a quantitative approach with the Pre-Experimental Design method. The research design used is the One-Group Pretest-Posttest Design. This design was chosen because the study aims to determine changes in students' mathematical conceptual understanding ability in the same group before and after being given treatment (Sugiyono, 2022). The research design is presented in Figure 1.

Figure 1. Research Design

Information :
O_1 = Pre-Test of mathematical concept understanding ability
X = Implementation of PMRI approach assisted by Quizizz media with Lubuklinggau tourism context
O_2 = Post-Test of mathematical concept understanding ability

This design provides an opportunity for researchers to obtain initial ability data, provide learning treatment, and then measure students' final abilities. Because the study does not use a control group, changes in scores were analyzed based on differences between pretest and posttest results.

Population and Sampel

The population of this study was all class VIII students of SMPIT An-Nida Lubuklinggau in the 2025/2026 academic year, totaling 142 students divided into five parallel classes (VIII.1–VIII.5). The research sample was selected using cluster random sampling, where sampling was carried out on class units (not individual students) considering that the five classes were relatively equal in terms of curriculum, learning time allocation, and student placement (non-flagship/non-grouped by ability). With an average of around 28–29 students per class, all five classes had an equal chance of being selected, ensuring that the lottery results proportionally represent population characteristics. The selection of the sample class was carried out through a lottery using the Wheel of Names application for the five class VIII sections. The lottery results designated class VIII.3 as the sample class with 29 students, who subsequently received treatment in the form of Quizizz-based learning media with the Lubuklinggau tourism context. This sample size is equivalent to approximately 20.4% of the total population (29 out of 142 students) and is deemed sufficient to represent the characteristics of eighth-grade students at the school, given that class distribution is heterogeneous.

Instrument Trial Class

Before being used to collect research data, the mathematical conceptual understanding test instrument was first trialed to empirically determine its level of validity and reliability. The instrument trial was conducted in another VIII class outside the research sample, namely class VIII.1, with 24 students. The selection of the trial class considered that students in that class had received the same prerequisite material as the sample class, making them suitable to test the instrument without involving them as primary research subjects.

Instrument Validity

The mathematical concept understanding test instrument was validated through two stages. First, content validity was conducted by expert validators, consisting of mathematics education lecturers and school mathematics teachers, to assess the alignment of questions with indicators of conceptual understanding, material appropriateness with prism and pyramid topics, accuracy of the Lubuklinggau tourism context used, and clarity/readability of question language. Validators' ratings and feedback served as the basis for revisions prior to testing. Second, after the instrument was declared valid by expert validators, an empirical validity test was conducted on the trial data from class VIII.1 to statistically measure item validity.

Instrument Reliability

Instrument reliability was calculated based on trial data from class VIII.1 using an appropriate formula for the instrument type (e.g., Cronbach's Alpha for essay questions). The reliability coefficient obtained was interpreted using the following criteria as presented in Table 1.

Table 1. Instrument Reliability Trial Results

Reliability Coefficient	Category
0,00 – 0,20	Very low
0,20 – 0,40	Low
0,40 – 0,60	Fair
0,60 – 0,80	High
0,80 – 1,00	Very high

An instrument is declared reliable if the reliability coefficient is at least in the high category (≥ 0.60). It should be noted that 0.60 is the lower threshold of the high category, so if the calculated result is exactly 0.60, the instrument is still declared reliable.

Research Procedure: Stages of PMRI Assisted by Quizizz

The implementation of learning in the sample class (VIII.3) followed four stages of Indonesian Realistic Mathematics Education (PMRI), with Quizizz serving as a supporting medium at each stage. In the first stage, understanding contextual problems, students are presented with initial problems linked to the tourism context of Watervang or Bukit Sulap, such as the shape of a gazebo roof, a dam wall, or souvenir packaging representing prisms and pyramids; at this stage, Quizizz is used to display illustrations and images interactively alongside starter questions to stimulate students. In the second stage, solving contextual problems, students work individually or in groups to solve problems using worksheets (LKPD) with their own methods, ranging from informal to formal approaches, while Quizizz is used as a step-by-step practice quiz that provides immediate feedback in the form of scores and

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explanations. In the third stage, comparing and discussing answers, students compare solution strategies across groups and discuss them to identify the most effective method; here, Quizizz is utilized through its report feature to display variations in answers so the teacher can guide class discussion based on emerging patterns, including misconceptions. In the fourth stage, drawing conclusions, the teacher and students conclude the concepts of prisms and pyramids studied, with Quizizz used as a final evaluation, or closing quiz, to measure conceptual understanding after learning.

The research was conducted from June 4 to 18, 2026, in class VIII.3 of SMPIT An-Nida Lubuklinggau. During the first meeting on June 4, 2026, the teacher opened the learning session, conducted apperception, presented the learning objectives, and administered the pretest. Afterwards, the teacher introduced Quizizz Presentation to carry out Stage 1 of PMRI, and students answered starter questions via Quizizz. In the second meeting on June 11, 2026, Stage 2 of PMRI was conducted: students were divided into five groups and given LKPD containing contextual problems related to prisms and pyramids, while Quizizz was used as a phased practice quiz with instant feedback as the teacher provided guidance. In the third meeting on June 18, 2026, Stages 3 and 4 of PMRI were carried out sequentially. In Stage 3, groups presented their discussion results while Quizizz reports displayed the variations in their answers, and in Stage 4, conclusions were drawn and a closing quiz was administered via Quizizz. Students then completed the posttest.

Instruments

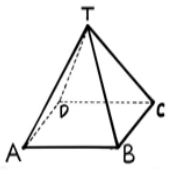
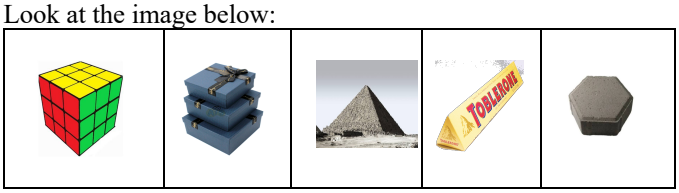
The research instrument was an essay test developed based on indicators of mathematical concept understanding, which include: (1) restating concepts, (2) classifying objects based on specific properties, (3) providing examples and non-examples, (4) presenting concepts in various representations, (5) applying concepts to problem-solving, and (6) connecting various mathematical concepts (Putri et al., 2021). The scope of learning outcomes, objectives, and indicators is presented in table 2.

Table 2. Specification Grid of Mathematical Concept Understanding Test

Learning Outcomes	Learning Objectives	Concept Understanding Indicators
At the end of Phase D, students are able to understand and solve contextual problems related to flat-sided 3D shapes (prisms and pyramids) and explain their basic concepts accurately. Students are also expected to Analyze flat-sided 3D shapes (prisms and pyramids) and Solve problems related to prisms and pyramids.	Students are able to Identify prism and pyramid shapes in real objects, Explain the definition of prisms and pyramids in their own words, and Identify elements of prisms and pyramids through group discussions.	1. Restating concepts in one's own words. 2. Classifying objects based on specific properties. 3. Providing examples and non-examples. 4. Presenting in various representations such as symbols, tables, graphs, or images. 5. Applying concepts to real problem-solving. 6. Connecting between concepts.

Additionally, the grid for the mathematical concept understanding test can be seen in Table 3.

Table 3. Specification Grid of Mathematical Concept Understanding Test

Essay Questions	Measured Concept Understanding Indicator
Write down the definition of a Pyramid in your own words! Mention the elements present in the adjacent image! 	(1) Restating concepts in one's own words
Look at the image below:  [1] [2] [3] [4] [5]	(2) Classifying objects based on specific properties; (3) Providing examples and non-examples
Which of these are Pyramid and Prism shapes? Give your reasoning by mentioning the properties of the object showing those shape properties!	
A prism has a height of 32 cm and an isosceles trapezoid base with side leg lengths of 10 cm. The parallel base lines are 15 cm and 27 cm. a. Draw the prism labeled with dimensions. b. Write the name of the formed prism!	(4) Presenting concepts in various representations
Jeno has a bathtub measuring 45 cm long, 40 cm wide, and 1 m deep. One day, because the tap was broken, Jeno filled the tub using a bucket holding 2.5 liters of water. How many buckets of water are needed to fill the bathtub?	(5) Applying concepts to real problem solving
Kiko will make a frame of a quadrangular prism using wire. The surface area of the quadrangular prism is known to be 1,350 cm². a) Determine the height of the prism. b) Draw the prism frame. c) Determine the total length of wire needed.	(6) Connecting various mathematical concepts

Based on Table 3, the instrument consists of five essay questions to measure six indicators. A single question item can measure more than one indicator (e.g., question item 2 measures both classifying objects and providing examples/non-examples).

Instrument Validity Testing

Validity testing was conducted using the Pearson Product Moment formula as follows:

$$r_{xy} = \frac{n\sum XY - (\sum X)(\sum Y)}{\sqrt{[n\sum X^2 - (\sum X)^2] - [n\sum Y^2 - (\sum Y)^2]}}$$ Sugiyono, (2022)

Description: :
r_{XY} = The correlation coefficient between x and y
$\sum XY$ = The product of x and y
n = The number of samples
X = The item score
Y = The total score

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The interpretation used to determine the validity of the test items, according to Sugiyono, (2022) is presented in Table 4.

Table 4. Correlation Coefficient Criteria

Value of r_{xy}	Criteria
$0,80 < r_{xy} \leq 1,00$	Very high validity
$0,60 \leq r_{xy} < 0,80$	High validity
$0,40 \leq r_{xy} < 0,60$	Fair validity
$0,20 \leq r_{xy} < 0,40$	Low validity
$r_{xy} < 0,20$	Very low validity

Significance was tested using the tcount value with degrees of frendom (df) = n-2. Items are validify $t_{count} > t_{table}$ at 5% significance level.

Table 5. Summary of Item Validity Test Results

Item	Value r_{xy}	t_{count}	t_{tabel}	Decision
1	0,728	4,986	1,717	Valid
2	0,501	2,718	1,717	Valid
3	0,478	2,555	1,717	Valid
4	0,654	4,052	1,717	Valid
5	0,759	5,468	1,717	Valid

Based on Table 5, all test items met validity criteria $t_{count} > t_{tabel}$

Instrument Reliability Testing

According to Sugiyono (2022) an instrument is considered reliable if it produces consistent data when administered at different times. A reliable and trustworthy instrument can also produce data that can be trusted. Since the test used in this study is an essay test, the formula used to calculate the reliability of the test items is Cronbach's Alpha formula, as follows:

$$r_{11} = \left(\frac{k}{k-1}\right)\left(1 - \frac{\sum \sigma b^2}{\sigma_t{}^2}\right)$$

Arikunto, (2014)

Description :
r_{11} = Instrument reliability
k = The number of questions or test items
$\sum \sigma_i^2$ = The sum of the item variances
σ_i^2 = The total variance

The classification of the reliability coefficient values is presented in Table 6.

Tabel 6. Instrument Reliability Correlation Coefficient Criteria

Component	Value
Number of question items	5
Item variance	1,90
Total variance	3,58
Reliability coefficient	0,60
Category	**High Reliability**

Based on Table 6, the reliability coefficient r_{11} is 0.60, falling under the high category.

Data Collection

The results obtained from the mathematical conceptual understanding test were determined using the assessment rubric, as presented in Table 7.

Table 7. Scoring Rubric for Conceptual Understanding Ability

Concept Understanding Indicator	Criteria	Score
Restating concepts in one's own words	No answer	0
	Unable to explain the concept	1
	Explanation is inaccurate with many errors	2
	Explains concept fairly accurately but incomplete	3
	Explains concept completely, accurately, in own words	4
Classifying objects based on specific properties	No answer	0
	Unable to group objects	1
	Grouping is inaccurate and inconsistent	2
	Groups objects with slight errors	3
	Groups objects accurately and consistently	4
Providing examples/non-examples & Presenting in various representations	No answer	0
	Unable to provide examples/non-examples or representations	1
	Examples/representations given are inaccurate	2
	Gives fairly accurate examples/representations, incomplete	3
	Gives correct examples/non-examples and representations	4
Applying concepts to problem-solving	No answer	0
	Unable to solve problem	1
	Solution is inaccurate	2
	Solves problem with fairly accurate steps	3
	Solves problem accurately and systematically	4
Connecting mathematical concepts	No answer	0
	Unable to connect concepts	1
	Connection between concepts is inaccurate	2
	Shows fairly accurate connections	3
	Shows accurate connections between concepts	4

The data were analyzed after obtaining students' responses to the mathematical conceptual understanding test instrument. The students' responses were then interpreted based on the criteria presented in Table 8.

Table 8. Categories of Mathematical Conceptual Understanding Ability

Score Range	Category
81–100	Very good
61–80	Good
41–60	Fair
≤ 40	Poor

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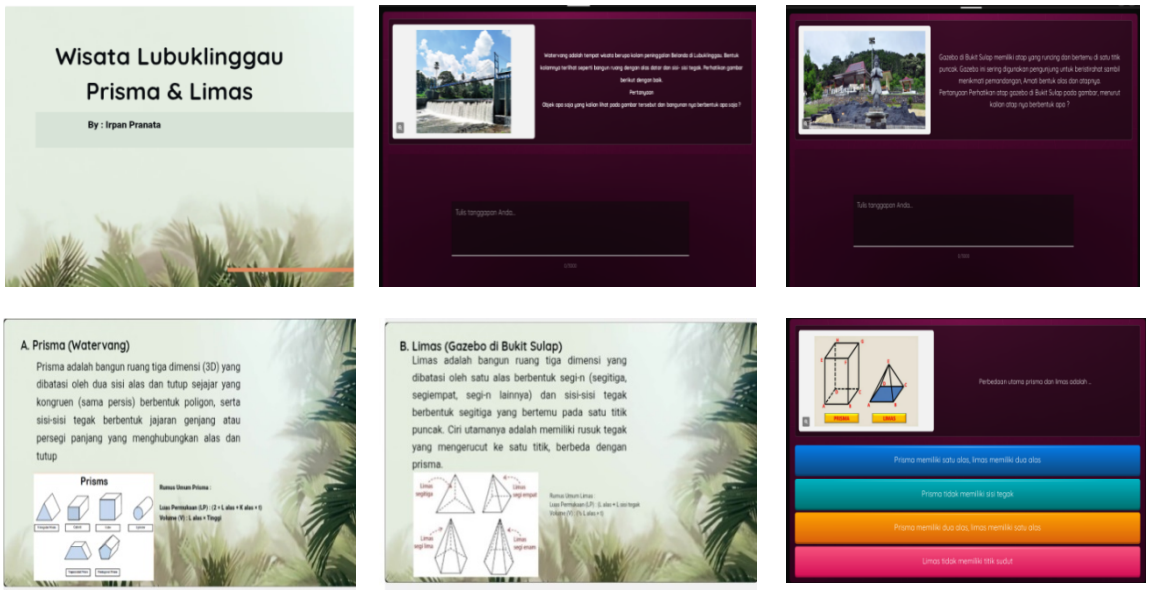
The data were analyzed using descriptive and inferential statistics. Descriptive statistics were used to describe students' mathematical conceptual understanding, while inferential statistics were used to test the research hypothesis. Since the data were not normally distributed, hypothesis testing was conducted using the Wilcoxon Signed-Rank Test at a 5% significance level.

Analysis

Data analysis in this study was conducted through three stages. Descriptive statistical analysis was first used to calculate the mean, standard deviation, minimum and maximum scores, and performance categorization percentages. This was followed by an analysis prerequisite test, in which a Chi-Square test was conducted to check normality; since both pretest and posttest data were not normally distributed ($P \leq 0.05$), non-parametric statistics were subsequently used. Hypothesis testing was then carried out using the Wilcoxon Signed-Rank Test at $\alpha = 0.05$, with the hypotheses formulated as H_0: $\mu_1 = \mu_2$ (no difference in concept understanding before and after learning) and H_a: $\mu_1 \neq \mu_2$ (there is a difference in concept understanding before and after learning), where μ_1 denotes the mean of students' mathematical conceptual understanding ability before learning (pretest) and μ_2 denotes the mean after learning (posttest). The test results showed that H_0 was rejected, and it was therefore concluded that the implementation of Quizizz-based learning media using the tourism context of Lubuklinggau resulted in a significant difference in the mathematical conceptual understanding ability of eighth-grade students at SMPIT An-Nida Lubuklinggau.

Results

In the implementation of learning using the PMRI approach, students used tourism-contextualized Quizizz learning media as a supporting medium for studying prisms and pyramids. The Quizizz learning media was designed interactively and systematically by integrating learning materials, practice questions, and evaluation quizzes. The use of this media also encouraged active student engagement throughout the learning process, allowing their conceptual understanding to develop more optimally, as shown in Figure 2.



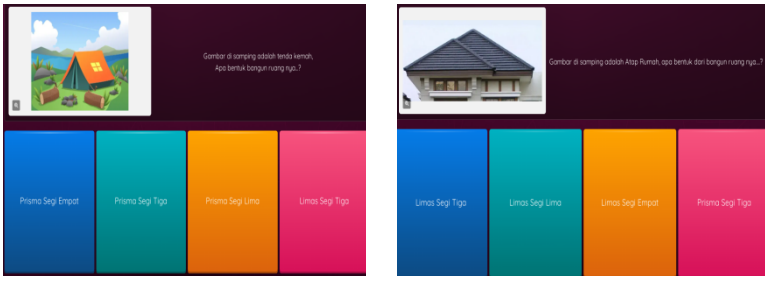


Figure 2. Quizizz Learning Media

In the first meeting, Figure 2 presents the use of Quizizz learning media for teaching prisms and pyramids through a presentation that integrates the tourism context of Lubuklinggau City, such as Watervang and Gazebo Bukit Sulap, making the learning material more closely related to students' daily lives. The teacher shared a Quizizz link so that students could access the learning materials using their respective gadgets, both during the learning process and for later review. The use of contextual images encouraged students to participate more actively and enthusiastically while facilitating their understanding of the concepts of prisms and pyramids. After studying the material, students completed reflection questions to assess their level of understanding. The results showed that most students had understood the material well. After all students completed the reflection activity, Quizizz automatically displayed a leaderboard based on the scores obtained, providing immediate feedback and increasing students' learning motivation.

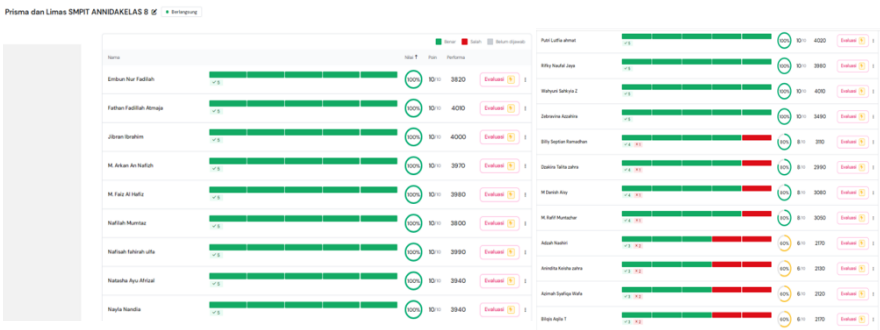
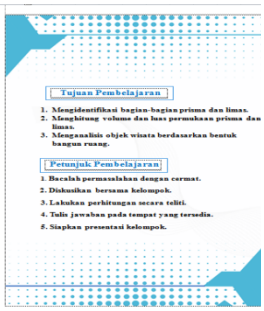
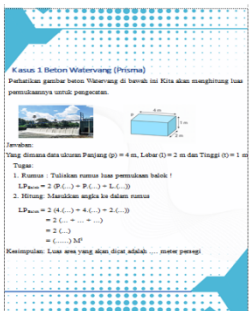


Figure 3. Student Activity in Quizizz Media Learning

Figure 3. Students' active participation in learning using Quizizz indicates that they were able to understand the learning material well. Based on the data presented above, most students answered the questions correctly, including two introductory questions and three in-depth questions concerning the basic concepts of prisms and pyramids, as well as examples of these geometric shapes in everyday life.





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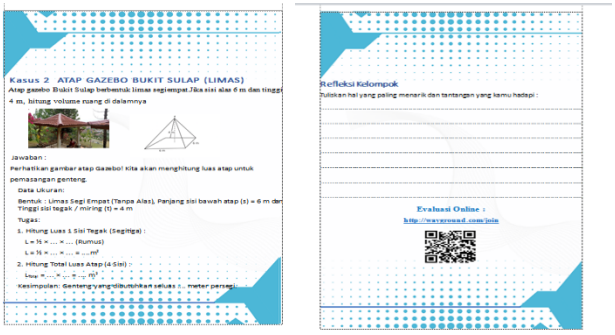

Figure 4. Student Worksheets (LKPD)

Figure 4 presents the use of the Student Worksheet *(*LKPD*)* during the second meeting. After the teacher explained the material using the textbook, the students were divided into five groups to complete the LKPD and present the results of their discussions. This activity aimed to foster cooperation and improve students' ability to solve contextual problems. As a result, two groups were able to solve the problems well, while the other three groups still made errors in applying the concepts. Based on these findings, the teacher provided evaluation and guidance to the groups that experienced difficulties by re-explaining the concepts that had not yet been understood and discussing the correct solution steps to improve students' understanding.

The research data were obtained through a mathematical conceptual understanding test administered during the pretest and posttest. The results are presented in Table 9.

Table 9. Descriptive Statistics of Pretest and Posttest Results

Statistical Data	Pretest	Posttest
Number of Students	28	28
Mean	32,06	48,27
Highest Score	55	80
Lowest Score	15	15

Based on Table 9, the students' mean score increased from 32.06 in the pretest to 48.27 in the posttest. These results indicate an improvement in students' mathematical conceptual understanding after the implementation of the PMRI approach assisted by Quizizz learning media in the learning process. To determine the significance of this improvement, a Wilcoxon Signed-Rank Test was conducted at a 5% significance level. The test results indicated a significant difference between the pretest and posttest scores. Therefore, the implementation of the PMRI approach assisted by Quizizz learning media was associated with an improvement in students' mathematical conceptual understanding. The results are presented in Table 10.

Table 10. Wilcoxon Signed-Rank Test Results

Data	Z_{count}	Z_{tabel}	Decision
Pretest & Posttest	3,29	1,96	Significant difference exists (H_0 rejected)

Based on Table 10, the results of the Wilcoxon Signed-Rank Test show that the calculated Z value Z_{hitung} = 3,29 based on the pretest and posttest data, while the critical Z value Z_{tabel} = 1,9 at a 5% significance level. The test results indicate a significant difference between the pretest and posttest scores. Therefore, the implementation of the PMRI approach assisted by Quizizz learning media was associated with an improvement in students' mathematical conceptual understanding.

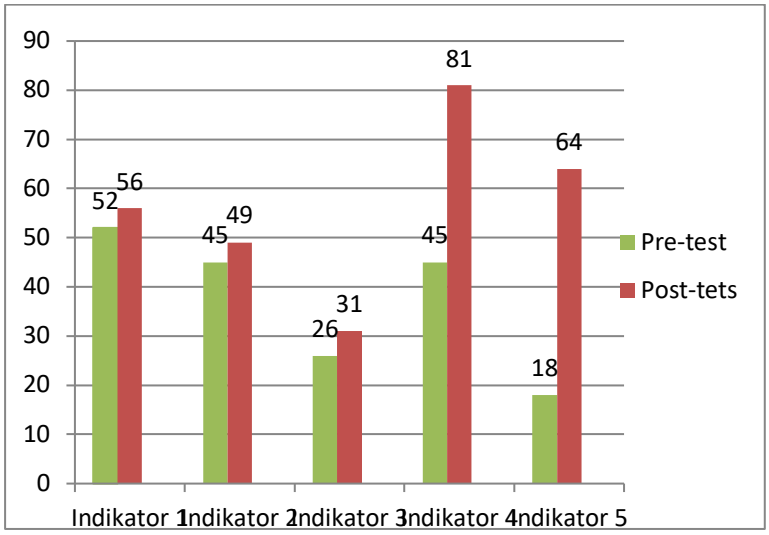

Figure 5. Graph of Students' Mathematical Conceptual Understanding by Indicator

Based on Figure 5, the data analysis results indicate an increase in all indicators of students' mathematical conceptual understanding after the implementation of the Indonesian Realistic Mathematics Education *(*PMRI*)* approach assisted by Quizizz learning media. This improvement indicates that learning initiated with contextual problems can help students gradually construct their understanding of mathematical concepts. In addition, the use of Quizizz made the learning process more interactive, enabling students to participate more actively in learning activities. For the indicator of restating a concept, the score increased from 52 to 56. This result indicates that students became more capable of explaining the concepts of prisms and pyramids using their own words. For the indicator of classifying objects based on certain properties and providing examples and non-examples of a concept, the score increased from 45 to 49. This finding indicates that students began to identify the characteristics of prisms and pyramids and classify objects based on their respective properties. Furthermore, for the indicator of presenting concepts in various mathematical representations, the score increased from 26 to 31. This improvement indicates that students began to represent concepts through drawings, symbols, and mathematical solution procedures. For the indicator of applying concepts or algorithms in problem solving, the score increased from 45 to 81. This result indicates that students became more capable of applying the concepts of prisms and pyramids to solve the contextual problems provided. Meanwhile, for the indicator of connecting various mathematical concepts, the score increased from 18 to 64. This improvement indicates that students began to connect the concepts they had learned to solve problems in a more systematic manner.

Discussion

The data on the hypothesis testing results and the achievement of each indicator of students' mathematical conceptual understanding have been presented in the Research Results section. The mean score increased from 32.06 in the pretest to 48.27 in the posttest, as further supported by the significant results of the Wilcoxon Signed-Rank Test. These findings are interpreted further as follows. The improvement in students' mathematical conceptual understanding occurred because the Indonesian Realistic Mathematics Education (PMRI) approach places contextual problems as the starting point of learning, allowing students to gradually construct their own understanding through meaningful learning experiences. In this

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study, the tourism context of Lubuklinggau presented through Quizizz-based learning media helped students relate the concepts of prisms and pyramids to situations close to their daily lives. Meanwhile, the use of Quizizz made the learning process more interactive, encouraging students to be more active, motivated, and enthusiastic in participating in learning activities. These findings align with the study by Trisyana et al. (2025), which states that the use of the Quizizz application as an interactive learning medium can foster student engagement in the learning process through interactive and enjoyable learning activities. This is also consistent with the research by Salam et al. (2022), which demonstrates that the use of Quizizz has a positive impact on students' motivation and learning outcomes.

The findings of this study are further supported by Wulandari et al. (2023) who showed that the use of Quizizz could improve students' mathematical conceptual understanding through the development of digital-based assessment instruments. This finding is consistent with the results of the present study, which showed an increase in students' mean scores from 32.06 in the pretest to 48.27 in the posttest. Furthermore, Wicaksono et al. (2025) state that the use of Quizizz has a significant impact on students' motivation and learning outcomes, and can create an interactive and enjoyable learning atmosphere. The integration of Quizizz with the PMRI approach using the tourism context of Lubuklinggau provided more meaningful learning experiences because students were able to connect mathematical concepts with their surrounding environment. This is further supported by Marleny et al. (2025) who explained that tourism-context-based mathematics learning can improve numeracy literacy, student engagement, and the meaningfulness of the learning process. The novelty of this study lies in the integration of the PMRI approach, Quizizz-based learning media, and the tourism context of Lubuklinggau in teaching prisms and pyramids, thereby providing a contextual and interactive learning experience for students' mathematical conceptual understanding.

Conclusion

This study demonstrates that implementing the Indonesian Realistic Mathematics Education (PMRI) model, supported by the Quizizz learning platform and incorporating the context of Lubuklinggau tourism, contributes to enhancing students' understanding of mathematical concepts regarding prisms and pyramids. Instruction that begins with contextual problems and utilizes interactive learning media helps students construct mathematical concepts more meaningfully, boosts engagement during the learning process, and strengthens conceptual understanding across all measured indicators. Hypothesis testing using the Wilcoxon Signed Rank Test revealed a significant difference between pretest and posttest scores, indicating that the PMRI model supported by Quizizz is effective in improving students' understanding of mathematical concepts. The study's contribution lies in the integration of the PMRI model, Quizizz, and the local tourism context of Lubuklinggau to provide a contextual, interactive, and student-centered alternative for mathematics instruction. However, the study has limitations; it employed a One-Group Pretest-Posttest design without a comparison group and was conducted with a single class and a limited sample size, meaning the findings cannot be widely generalized. Therefore, future research should utilize an experimental design with a control group, involve a larger sample, and apply the PMRI model supported by Quizizz to different mathematical topics and educational levels to yield more comprehensive findings.

Conflict of Interest

The authors declare no conflict of interest.

Auhor Contributions

I.P. was responsible for conceptualization, investigation, data collection, data analysis, and writing the original draft; Y.Y. contributed supervision, methodology, validation, and writing—review and editing; and K.U.Z.N contributed supervision, validation, methodology, and writing—review and editing. All authors have read and approved the final version of the manuscript. The distribution of contributions to the conceptualization, writing, and revision of this research is as follows: I.P.: 50%, Y.Y. : 25%, and K.U.Z.N.: 25%.

Data Availability Statement

The data supporting the findings of this study are available from the corresponding author upon reasonable request. The data are not publicly available because they contain information related to student research participants.

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