



# Song Media Improves Mathematics Learning Outcomes of Elementary School Students on Two-Dimensional Figures

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## Abstrak

Permasalahan yang ada saat ini adalah matematika dianggap sebagai mata pelajaran yang sulit karena berkaitan dengan rumus dan aritmatika. Hal ini berdampak pada kemampuan matematika siswa sekolah dasar di Indonesia yang rendah sehingga perlu ditingkatkan. Berdasarkan hal tersebut, penelitian ini bertujuan untuk menganalisis pengaruh media lagu terhadap hasil belajar matematika siswa kelas tiga sekolah dasar. Jenis penelitian ini adalah penelitian quasi experimental dengan one group pretest posttest design. Subjek penelitian ini berjumlah total siswa 36 orang. Metode yang digunakan untuk mengumpulkan data yaitu tes. Instrumen yang digunakan untuk mengumpulkan data yaitu lembar soal tes. Teknik yang digunakan untuk menganalisis data yaitu analisis statistik inferensial. Hasil penelitian yaitu ada pengaruh penggunaan media lagu terhadap hasil belajar matematika bangun datar. Hasil uji menunjukkan terdapat perbedaan hasil belajar antara siswa yang menggunakan media lagu dengan siswa yang tidak menggunakan media lagu dalam pembelajaran matematika. Disimpulkan bahwa media lagu dapat meningkatkan hasil belajar matematika pada siswa kelas tiga khususnya dalam pembelajaran matematika.

**Kata Kunci:** Media Lagu, Matematika, Sekolah Dasar

## Abstract

The current problem is that mathematics is complex because it relates to formulas and arithmetic. This impacts the low mathematics abilities of elementary school students in Indonesia, so they must be improved. Based on this, this research aims to analyze the influence of song media on the mathematics learning outcomes of third-grade elementary school students. This type of research is a quasi-experimental research with a one-group pretest-posttest design. The subjects of this research were a total of 36 students. The method used to collect data is a test. The instrument used to collect data is the test question sheet. The technique used to analyze data is inferential statistical analysis. The results of the research show that the use of song media influences learning outcomes in flat-figure mathematics. The test results show that there are differences in learning outcomes between students who use song media and students who do not use song media in learning mathematics. It was concluded that song media can improve mathematics learning outcomes in third-grade students, especially in mathematics learning.

**Keywords:** Song Media, Mathematics, Elementary School

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## 1. INTRODUCTION

Mathematics is a subject that studies concepts, measurement and geometry, algebra and data management. Concepts are built through a deductive reasoning process, but the inductive reasoning process can be carried out at the beginning of learning so that mathematics is easy to understand (Fauzy & Nurfauziah, 2021; Rismawati & Khairiati, 2020). Mathematics is an important basic science that must be mastered by students from elementary school to middle school. Hence, learning mathematics requires strategies that can become the basis for carrying out the learning process. Teachers can teach mathematics in elementary schools by understanding the basic concepts of mathematics (Astuti, 2018; Hendriawan & Septian, 2019; Rulyansah & Sholihati, 2018). Before teaching, teachers must understand basic mathematical concepts and the relationships between various number systems. This activity will help teachers develop students' understanding of mathematics. Apart from that, students in elementary schools are entering the concrete operational stage, so

there is a need for media (Hasanah et al., 2023; Rulyansah & Sholihati, 2018; Sari et al., 2020). Mathematics requires concrete objects so that the material is easy for students to understand. Apart from that, another approach is for teachers to use effective learning strategies (Hidayat et al., 2020; Yeni Yuniarti, 2016).

The current problem is that mathematics is considered a difficult subject because it is related to formulas and arithmetic. This is supported by previous findings, which state that there are still many students who are only interested in studying mathematics if there are demands for material that must be completed (Ramadayanti & Adzima, 2022; Septian et al., 2019). Several studies also reveal that the mathematical abilities of elementary school students in Indonesia still need to improve (Sartika, 2019; Suwela, 2021). Several factors can cause the decline in literacy skills in mathematics. First, there needs to be more student interest and concentration in mathematics lessons. Second, there is a need for student discipline in learning mathematics. Third, students experience difficulties learning mathematics due to the need for more learning media that supports mathematics learning (Buchori & Rahmawati, 2017; Hakim & Windayana, 2016). Based on the results of interviews with teachers at SD Negeri Wonobodro 01, Batang Regency, information was obtained that learning was carried out using conventional methods such as questions and answers and exercises. However, there were still many students who did not understand and master the material about flat shapes because each child's grasp was different. The results of the observations also show that there needs to be more use of learning media that can help students learn mathematics. This problem certainly has an impact on students' low mathematics learning outcomes.

Learning mathematics in elementary schools requires attention from the government, teachers, and even parents because learning mathematics in elementary schools is the foundation for learning mathematics at the next level of education. Learning activities are not just teaching activities but learning activities are more complex and carried out with varied learning patterns (Nugroho et al., 2020; Rakoczy et al., 2019; van Es et al., 2017). Teachers, as facilitators, are obliged to provide a creative learning environment for student learning activities in class (Arisoy & Aybek, 2021; Primasari et al., 2019; Suprianto et al., 2019). One of the activities that must be carried out is monitoring and selecting methods. A method used by teachers to teach must be truly mastered so that when used, it can create an interactive atmosphere (Hidayat et al., 2020; Purwitaningrum & Prahmana, 2021). Teachers must use varied methods so that mathematics learning can be carried out in a fun way. The current development of digital information has transformed increasingly modern globalization. The progress and speed of internet access have had implications for changes in the use of technology based on networks or online learning (Andini et al., 2018; Hendriawan & Muhammad, 2018; Hendriawan & Septian, 2019). Teachers can use this to support mathematics learning. Based on these problems, the solution that can be offered is to use learning media that can support mathematics learning, namely song media.

Media plays an important role in providing information to students. This role includes supporting student learning and adding structure to learning planning and learning implementation (Amelia & Harahap, 2021; Sina et al., 2019). Interesting and innovative media is very important for increasing student motivation and learning outcomes (Buchori, 2019; Margarita et al., 2018). Media Songs created based on learning material can help students remember and understand the material better (Nugroho & Muhammad, 2022; Santosa & Christupar, 2021). Song media in learning is a tool that teachers can use to achieve learning goals. Songs can be used to help students understand the material more easily, increase interest in learning, and clarify complex concepts (Nisa' et al., 2023; Prananda et al., 2020). Songs must be modified so that they contain material and sound fun to students. Apart from that, musical chants are easier to memorize than written learning material.

Previous research findings also reveal that innovative learning media can facilitate and make it easier for students to learn (Hasanah et al., 2023; Rulyansah & Sholihati, 2018). Other research also reveals that mathematics for elementary school students requires appropriate learning media so that it can make it easier for students to understand mathematical concepts (Rahmani & Widyasari, 2018; Sari et al., 2020). Other research also reveals that song media can be used to make it easier for students to learn (Ifadah & Aimah, 2018; Putri & Desyandari, 2019). However, there has yet to be a study regarding song media to improve mathematics learning outcomes in two-dimensional figures. The advantage of song media is that it can help increase students' interest in learning again, especially in mathematics. Based on this, this research aims to analyze the influence of song media on the mathematics learning outcomes of grade 3 elementary school students. It is hoped that the song media can overcome students' difficulties in understanding the concepts of flat shapes, especially in combination with flat shapes.

## 2. METHODS

This type of research is a quasi-experimental research with a one-group pretest-posttest design. This research does not use a comparison class but has used a preliminary test to determine the magnitude of the effect or influence of using song media. In this research, the subjects were first given a pretest to determine the extent of the student's initial abilities before being given mathematics learning about flat shapes using song media. After an initial test, the students were given treatment, namely learning Mathematics using song media. After completing the study of mathematics using song media, all students were given a final test (posttest) to determine the extent of the influence of learning mathematics using song media on the results of learning mathematics using flat shapes as material.

The subjects of this research were class III students at SD Negeri Wonobodro 01, which had 36 students. The method used to collect data is a test. The initial test was given to determine students' abilities before being given treatment in the form of learning to build space using song media. Meanwhile, the final test was given to determine the level of progress or influence of learning spatial building materials using song media after the treatment. The initial test and final test use the same test equipment. The instrument used to collect data is the test question sheet. The test question grid is presented in Table 1.

**Table 1. Research Instrument Grid**

Basic competencies	Indicator	Knowledge Aspect						Number of Questions
		C 1	C 2	C 3	C 4	C 5	C 6	
III. Discover the elements and properties of simple flat shapes based on observations.	Analyze various flat shapes based on their properties				✓			5
	Determine the types of various plane shapes based on the description				✓			2
Understand the perimeter of triangles and rectangles using concrete objects (thread, rope, matchsticks, sticks and sharing objects that can be used as a unit of area.	Calculate the area of a flat shape based on the image				✓			1
	Determine examples of various flat shapes that exist around you				✓			2

The technique used to analyze data is inferential statistical analysis. This research will test the research hypothesis using the T-test. Before the t-test, normality, and homogeneity tests were carried out. The normality test determines whether the data is normally distributed (Sugiono, 2015). The homogeneity test shows that two or more sample data from a population have the same variance. In other words, the homogeneity test is carried out to determine whether the data set under study has the same characteristics (Sugiono, 2015). The indicator of the success of this research is that there is an increase in student learning outcomes after implementing shape material learning using song media. It is hoped that it will be more significant than before when learning did not involve song media.

### 3. RESULTS AND DISCUSSION

#### Result

This research was carried out 6 (six) times and was given songs containing material about flat shapes, including flat shapes. The first meeting carried out a pre-test by giving mathematics questions on flat shapes consisting of 10 questions with multiple-choice answers. Learning mathematics using song media is taught by giving students song media with shape material. The teacher invites the students to sing the song together and repeat it 3 (three) times or until they can sing it themselves without being guided by the teacher. The teacher then asked one of the students, as a student representative, to draw a flat square shape on the blackboard. The teacher then discusses square shapes using pictures and text content in the song media.

The 2nd, 3rd, 4th, and fifth meetings carried out the same learning steps as in the first meeting. In the sixth meeting, learning was carried out by repeating the material that had been previously taught at the previous meeting, including the properties of squares, rectangles, parallelograms, and trapezoids. In the sixth meeting, the repeated material was the properties of rhombuses, kites, triangles, and circles. At the sixth meeting, mathematics questions on flat shapes were given, which contained 10 questions.

The initial analysis showed that learning mathematics in flat-shaped material before using song media obtained an average score of 7.78, with the lowest score being 6 and the highest being 10. In contrast, the average value of mathematics learning results in shape material was obtained after using song media. 8.53, with the lowest score of 7 and the highest score of 10. From this study, it can be concluded that the results of learning mathematics for flat shapes material for grade 3 elementary school students experienced an average increase of 0.75, and the lowest score after using song media experienced an increase of 5 to 7. The students' mathematics learning results before and after using song media are presented in Table 2.

**Table 2. Students' Mathematics Learning Results for Flat Figure Material Before and After Using Song Media**

<b>Mathematics Learning Outcomes</b>	<b>Mean</b>	<b>Median</b>	<b>SD</b>	<b>Min-Maks</b>
Before using Song Media ( <i>Pre Test</i> )	7.78	8	1.198	5-10
After using Song Media ( <i>Post Test</i> )	8.53	8.5	0.810	7-10

Next, a normality test was carried out on the students' mathematics learning outcomes data. The normality test aims to determine whether the data used is normally distributed. The normality test was carried out on the results of mathematics learning material about flat figures to determine the distribution of research data. The normality test used was Shapiro-Wilk because the sample size was less than 50 children. The results of the normality test are presented in Table 3.

**Table 3.** Normality Test Results for Mathematics Learning Results for Flat Figure Material

Mathematics Learning Outcomes	Sig	Information
<i>Pre-Test</i>	0.061	Normally distributed
<i>Post Test</i>	0.073	Normally distributed

The results of the normality test show the results of the Shapiro-Wilk normality test, namely that the results of studying mathematics in the pre-test flat shape material obtained sig  $0.061 > 0.05$ , so the research data is said to be normally distributed. The results of learning mathematics in the pre-test flat shape material obtained sig  $0.073 > 0, 05$ , which means the research data is said to be normally distributed. The normality test results on mathematics learning outcomes for flat shapes can be concluded to have a normal distribution for the pre-test and post-test. Next, a homogeneity test was carried out on the results of mathematics learning results regarding flat shapes. The homogeneity test results are presented in [Table 4](#).

**Table 4.** Homogeneity Test Results

		Levene Statistic	df1	df2	Sig.
Learning Outcomes	Based on Mean	3.044	1	70	0.085
	Based on Median	1.881	1	70	0.175
	Based on Median and with adjusted df	1.881	1	68.916	0.175
	Based on Trimmed Mean	2.809	1	70	0.098

Based on the results of data analysis, it was found that the homogeneity test result was 0.085, so that  $0.085 > 0.05$ , meaning that the variance in mathematics learning outcomes data for before and after using song media was said to be homogeneous. Next, a hypothesis test is carried out. The results of the paired t test obtained sig  $0.000 < 0.05$  so that there is an influence of the use of song media on the learning outcomes of flat shape mathematics. The results of data analysis are presented in [Table 5](#).

**Table 5.** T-test results

		Paired Differences							
		Mean	Std.Deviation	Std Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
					Lower	Upper			
Pair 1	<i>Hasil Belajar (Pre Test)</i> <i>Hasil Belajar (Post Test)</i>	-0.750	0.937	0.156	-1.067	-.0433	-4.801	35	0.000

**Discussions**

This research shows that the use of song media influences the mathematics learning outcomes of class students in flat shapes. First, song media can improve mathematics learning outcomes in elementary school students. Songs can help students understand the material more easily, increase interest in learning, and clarify complex concepts (Nugroho & Muhammad, 2022; Santosa & Christupar, 2021). Using song media in learning can also help



improve understanding because songs can provide a means of speech that is unconsciously stored in the brain (Bakar, 2016; Nisa' et al., 2023; Prahesti et al., 2020). Songs also make it easier for students to understand learning material because they can help clarify complicated concepts. Song media can make learning more accessible for students, improving mathematics learning outcomes for elementary school students.

Second, using song media can increase motivation to learn mathematics in elementary school students. Teachers can use song media in thematic learning in elementary schools (Lestari et al., 2017; Prananda et al., 2020). Song media can help increase students' interest in learning again, which is one of the problems faced due to students' need for more motivation in learning mathematics. Songs can also help increase students' creativity in musical arts (Anggraini et al., 2019; Nugroho & Muhammad, 2022). Songs can make students more active in learning mathematics. Students can participate in making songs and become actors in songs. Songs can make learning more interactive and increase students' motivation to learn.

Third, using song media can increase the pleasant atmosphere of mathematics learning. Songs must be created in a way that is easy for students to understand (Bakar, 2016; Nisa' et al., 2023; Prahesti et al., 2020). This can be done using language that is easy to understand. Songs that are modified to make the learning material sound fun (Lestari et al., 2017; Prananda et al., 2020). Additionally, musical chants are more accessible to memorize than written learning material. Songs have exciting characteristics and make it easier for students to understand the material to provide a comfortable learning atmosphere (Sutriyani & Widyatmoko, 2020; Untari et al., 2017). Songs can help students understand complex mathematical concepts more easily and enjoyably. Using song media can help improve a pleasant learning atmosphere and make students happier in mathematics.

Previous findings explain that song media can be used in mathematics learning, such as making songs to help students memorize mathematics material (Dewantari et al., 2023; Sandri, 2018). Other research also reveals that the use of song media in learning must be adjusted to the needs and conditions of students so that the media used has a critical position as a tool in achieving learning goals (Suriyana et al., 2020; Sutriyani & Widyatmoko, 2020; Untari et al., 2017). The use of song media influences learning outcomes. The limitation of this research is that it only examines the application of song media to shape material for third-grade elementary school students. This research implies that song media can improve elementary school students' learning outcomes, especially in plain material.

#### **4. CONCLUSION**

The research results regarding learning mathematics regarding flat shapes before the use of song media have increased. The test results also show an influence of the use of song media on the mathematics learning outcomes of flat figures for grade 3 elementary school students. Song media can improve elementary school students' learning outcomes, especially in plain material.

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