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THE EFFECT OF MATHEMATICS TEACHING SUPPORTED BY MATHEMATICS STORIES ON 3RD-GRADE STUDENTS' ACHIEVEMENT AND ATTITUDES

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Abstract

Integrating mathematics with children's literature that appeals to children's emotions and thoughts can help children look at mathematics from a different perspective and see the fun aspects of mathematics. This study examined the effect of mathematics lessons supported by mathematics stories on 3rd-grade students' mathematics achievement and attitudes towards mathematics. The study evaluated students using a quasi-experimental design with the pretest-posttest control group. The study group consisted of 39 third-grade students, 19 in the experimental group and 20 in the control group. The "3rd-Grade Mathematics Achievement Test" was used to measure students' achievement, and the "Attitude Scale towards Mathematics Course" was used to measure their attitudes toward mathematics. In analyzing the data obtained from the students, the normality of the data was first checked. Since the data showed normal distribution, parametric tests were used to analyze the data. In the research, the "Independent Samples T-test" was used for intergroup comparisons, and the "Dependent Samples T-test" was used for intragroup comparisons. As a result of the data analysis, it was found that the mathematics achievement and attitude towards mathematics scores of the experimental group students differed significantly in mathematics lessons supported by mathematical stories in intergroup and intragroup comparisons. This result shows that including children's literature containing mathematical stories in mathematics lessons will positively affect students' mathematics achievement and attitudes toward mathematics.

Keywords: Children's literature; mathematics achievement; attitude; primary school.

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1. Introduction

In our world, where technology and knowledge surround us rapidly, the importance and usage areas of mathematics, seen as an abstract field, are gradually increasing. However, for some reason, this course is considered boring and unpleasant, consisting of many formulas and numbers for most people (Yetim Karaca & Ada, 2018). Mathematics is an important discipline in which new knowledge is acquired, checked, and transferred to the next generation. At the same time, mathematics, which is a field that we can apply regardless of time and place, is a reliable tool for learning information in a systematic way (Güler Selek, 2020). Therefore, it is inevitable to learn mathematics, which is a discipline that develops communication, necessary analysis and generalization, and creative and independent thinking in daily life and business life (İlgün & Altıntaş, 2019). In addition to its value, mathematics is important in physics and chemistry. It has recently come to the forefront as an important discipline in verbal fields such as literature and social studies (İlgün & Altıntaş, 2019).

Due to the importance of mathematics, questions such as "What is mathematics?" "What is it for?" "How should it be taught?" has been frequently asked by researchers in recent years, and significant research has been conducted on this subject (Güler Selek, 2020; Olkun & Toluk Uçar, 2020). When these studies are examined, it is seen that in the last thirty years, there has been a tendency towards an understanding based on the foundations of mathematics from the traditional understanding of mathematics education in which mathematical knowledge is given by separating mathematical knowledge into small pieces of skills (Olkun & Toluk Uçar, 2020). This is because students tend to learn the meanings and relationships underlying formulas, rules, and symbols rather than memorizing many procedures, rules, and symbols. This way, skills such as where formulas and definitions come from in mathematics, how to reach and verify correct generalizations from definitions, and how to make valid reasoning are developed (Olkun & Toluk Uçar, 2020).

Today, when learning by doing mathematics has gained importance, it is known that mathematics teaching is important not only by relating mathematical subjects with each other but also by associating them with different disciplines and daily life (Durmaz & Can, 2021; Güler Selek, 2020; Olkun & Toluk Uçar, 2020). Especially in recent years, the importance of interdisciplinary approaches and approaching problems from different perspectives has increased in relating mathematics, which is a vital tool in sustaining daily life, with daily life and other fields, and studies on integrating different disciplines have come to the fore (Crowther, 2012; Durmaz & Can, 2021; Lipszyc, 2014). Because integrating mathematics with other fields supports the development of mathematical relating and mathematical literacy skills (Aladağ & Şahinkaya, 2013; Munro, 2013).

Integrating children's literature with mathematics lessons, where verbal skills such as reading, writing, and speaking are required, has come to the fore as one of the approaches that can be used for this purpose in recent years (Boavida et al., 2008; Yalçın et al., 2022). In

integrating different disciplines, teaching mathematics lessons using stories or other books is gaining importance in the educational sciences literature (Durmaz & Can, 2021). Qualified works in which emotions, thoughts, dreams, situations, and events that appeal to the child's interests, wishes, and tastes are handled with pedagogical sensitivity constitute children's literature. Children's literature includes products whose target audience is children and are created to inform and entertain readers. With these products, children can gain the ability to think about events and situations and to look at life from different perspectives (Akdağ, 2021). In addition, these products can help develop positive attitudes towards mathematics and mathematics lessons by considering students' affective and cognitive characteristics.

Integrating children's literature and mathematics offers important opportunities to relate mathematical content to daily life (Moyer, 2000). This integration has significant benefits in revealing misconceptions, acquiring mathematical language and developing mathematical speaking skills, providing different solutions to problems, differentiating teaching, and preparing the ground for developing materials or games (Casey et al., 2008; Courtade et al., 2013; Durmaz & Can, 2021; Forbringer, 2004; Green, 2013). It also has other advantages, such as relieving mathematics anxiety, motivating learning, and making learning more permanent (Durmaz & Can, 2021; Furner, 2017; Keat & Wilburne, 2009; Ruiz et al., 2010; Whitney et al., 2017). However, there are some issues to be considered in the integration of children's literature and mathematics. In using children's literature products in mathematics teaching, great importance should be attached to the selection of books. These books should teach, develop, and review mathematical concepts without confusion and have important features such as explaining problems, creating interesting problems, and even inspiring (Akdağ, 2021). Therefore, it should be examined whether the books to be used are suitable for mathematics teaching, and if there are some problems in these books, necessary adaptations should be made (Durmaz & Miçooğulları, 2021). In addition, the competencies and beliefs of teachers who will integrate mathematics teaching with children's literature are also very important (Can & Durmaz, 2023). It is of great importance for effective teaching that teachers are aware of the existence of children's books on the subject they will cover or that they can produce a fictional text on the relevant subject themselves. In this way, teachers can help their students overcome their fear of mathematics and learn mathematics with fun (Akdağ, 2021). Therefore, teachers have important duties and responsibilities such as researching which sources of children's literature they can benefit from, recognizing children's books, producing their texts, and producing activities (Akdağ, 2021; Can et al., 2020). Looking at the studies conducted in the literature, it is seen that these studies are primarily preschool and middle school level studies (Durmaz & Miçooğulları, 2021; Edelman et al., 2019; Yalçın et al., 2022). Therefore, conducting experimental research with primary school students will contribute to the literature from various perspectives.

Although mathematics and children's literature seem to be two different disciplines, recent studies show that these disciplines yield significant results when successfully integrated. In national and international studies, mathematics courses integrated with children's literature had

positive effects on students and pre-service teachers' achievement (Capraro & Capraro, 2006; Durmaz & Miçooğulları, 2021; Lemonidis & Kaifa, 2019; Yalçın et al., 2022), interest in mathematics (Mink & Fraser, 2005), attitudes (Cankoy, 2011; Munro, 2013) and beliefs (Can & Durmaz, 2023). These studies were conducted with preschool and middle school students, pre-service teachers, and teachers (Can et al., 2020; Can & Durmaz, 2023; Durmaz, 2022; Durmaz & Miçooğulları, 2021; Yalçın et al., 2022). In contrast to these studies, some studies showed that the integration of mathematics with children's literature did not affect mathematics achievement (Hassinger-Das et al., 2015), attitudes towards mathematics and problems (Stone, 2016; White, 2003), mathematical association self-efficacy and mathematical self-efficacy levels (Yalçın et al., 2022). Therefore, there is a need for more diverse research findings on integrating children's literature and mathematics. The fact that the current study is an experimental study conducted with primary school students is considered important in this respect. This study aimed to examine the effect of mathematics lessons supported by mathematical stories on the mathematics achievement and attitudes of 3rd-grade students. In order to achieve this aim, the following problem statements were sought in the study:

1. Does mathematics teaching supported by mathematical stories significantly affect students' mathematics achievement?

2. Does mathematics teaching supported by mathematics stories significantly affect students' attitudes toward mathematics?

2. Method

2.1. Research model

In this study, which aims to investigate the effect of mathematical stories on student achievement and attitudes toward mathematics in mathematics education, a quasi-experimental model with a pretest-posttest control group was used. The reason for choosing the quasi-experimental model is that it is not possible to assign the students in the sample to the experimental and control groups impartially (Büyüköztürk et al., 2020). The experimental design of the study is shown in Table 1.

Table 1. The implementation process of the research

Groups	Pretest	Implementation	Posttest
Experimental	Mathematics Achievement Test and Attitude Scale	Teaching math with stories	Mathematics Achievement Test and Attitude Scale
Control	Mathematics Achievement Test and Attitude Scale	Mathematics teaching based on textbooks	Mathematics Achievement Test and Attitude Scale

As seen in Table 1, the experimental and control groups applied the mathematics achievement test and attitude scale as pretests. After the application, the mathematics achievement test and attitude scale were reapplied as posttest, and the process was completed.

2.2. Study group

The study was conducted with 39 3rd-grade students in a province in western Turkey. In determining the experimental and control groups, a mathematics achievement test was applied as a pretest in a public school with three different classes, and two groups showing close averages according to the pretest results were included in the study, one as the experimental group and the other as the control group. The characteristics of the students in the groups are shown in Table 2.

Table 2. Student characteristics in the study group

Groups	Female	%	Male	%	Total
Experimental	10	52.63	9	47.37	19
Control	11	55	9	45	20
Total	21	53.84	18	46.16	39

Table 2 shows 39 students in the experimental and control groups. Ten of the 19 students in the experimental group (52.63%) were female, and 9 (47.37%) were male. Eleven of the 20 students in the control group were female (55%), and 9 were male (45%). In this case, the number of female students in the experimental and control groups is very close to each other, and the number of male students is equal.

2.3. Data collection tool

The "Mathematics Achievement Test" developed by the researchers and the "Attitude Scale towards Mathematics" developed by Aşkar (1986) was used.

In the study, a "Mathematics Achievement Test" was prepared to measure students' mathematics achievement. For this purpose, 18 story books belonging to the Scientific and Technological Research Council of Turkey [TÜBİTAK] publications, which will be used in the study, were first analyzed. These books were selected from 12 books that were related to the 3rd-grade learning outcomes. A question pool of 25 questions was created to cover the learning outcomes of the identified books. While creating the questions in this pool, the achievement comprehension tests of the Ministry of National Education, textbooks, and resources of various publishing houses were used. Then, expert opinions were obtained from three classroom teachers and a field educator with a Ph.D. in Classroom Education to test the test's content validity. According to the expert opinion, it was stated that five questions in the

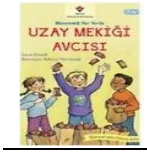
test were simple, and these questions were removed from the test. The reliability of the test was calculated by applying the remaining 20 questions to 66 3rd-grade students. In the test, which included multiple-choice questions, correct answers were calculated as 1 point and incorrect or blank answers as 0 points. The calculated KR-20 value was 0.71. After these procedures, the remaining 20 questions were applied to the experimental and control groups, and the data were collected.

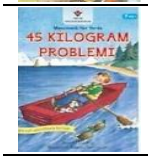
The study collected data on students' attitudes towards mathematics courses with the "Attitude Scale towards Mathematics Course" developed by Aşkar (1986). This scale consists of 20 items in a 5-point Likert type. Cronbach's Alpha reliability coefficient of the scale is 0.83. The Cronbach's Alpha reliability coefficient calculated for this study was also 0.83.

2.4. Implementation process

In the study, pretests were applied first. After the pretests were applied, mathematics lessons in the experimental group were taught for ten weeks using mathematical stories. In the experimental group, 12 books in the "Mathematics is Everywhere" story set of TÜBİTAK publications provided by the researchers were used. The stories in the collection were selected in accordance with the mathematics topic each week. The stories appropriate to the subject were read aloud after the teacher's lecture. The mathematical content in the story was analyzed and solved during the reading. Then, students were asked questions about the stories. The questions in the back of the book were also solved after completing the reading activity. In order to answer the questions in the story, students were encouraged to use their lecture notes and textbooks or ask questions to each other. The storybooks in the set that the students were interested in reading were distributed to the students regularly every week. While reading the story, important parts were read to the students repeatedly, and important concepts were emphasized. The control group's math lessons were taught per the textbook-based education approach. After completing the applications, the Mathematics Achievement Test and Attitude Scale Towards Mathematics Course were applied again to both groups. Information about the storybooks used in the lessons and the related learning outcomes are presented in Table 3.

Table 3. Information about the stories in the Mathematics Everywhere story set

Story photo	Story and Author name	Related Learning Outcome
	Bora's Sunday Excitement Barbara deRubertis	"Counts rhythmically by one, ten, and one hundred starting from any number within 1000."
	Space Shuttle Hunter Laura Driscoll	"Determines the digit names of three-digit natural numbers and the place value of the digits in their digits."

Story photo	Story and Author name	Related Learning Outcome
	Long Waiting Annie Cobb	"Rounds at most three-digit natural numbers to the nearest tens or hundreds."
	Görkem Counts Daphne Skinner	"Compares at most five natural numbers less than 1000 and sorts them using symbols."
	Clean Campers Lucille Recht Penner	"Determines the fraction of a given unit fraction of a multiple."
	Moving Chickens Pam Pollack and Meg Belviso	"Draws a square, rectangle, and triangle using a ruler; determines the diagonals of a square and rectangle."
	Müge Measures Everything Linda Williams Aber	"Explains the relationship between meters and centimeters and writes in terms of each other."
	Ali's Foot Squares Nat Gabriel	"Cover and measure the area of shapes with appropriate non-standard material."
	Slow Kaan Lucille Recht Penner	"Compares the duration of events."
	45 Kilogram Problem Jennifer Dussling	"Estimates the mass of an object and checks the accuracy of the estimation by measuring."
	Who Has Bubbles? Linda Williams Aber	"Explains the information shown in the graphs of shapes and objects, transforms from graphs to tally and frequency tables, and interprets them."
	Justice Will Prevail Jennifer Dussling	"Solves problems that require addition and subtraction operations by using the information given in graphs or by creating graphs."

As seen in Table 3, 12 storybooks were used in the study. The names of these books and the related learning outcomes are in the table respectively. To give an example of the processing of the mathematics subject in these books: In the book Bora's Market Excitement, a boy named Bora helps his grandmother with gardening and market stalls. Before going to the market, Bora and his grandmother collect the produce from the garden and put it in boxes. While Bora was picking the limes from the products they would take to the market, he rhythmically counted forward one by one, counting up to 20, and put them in the box. He then counted the onions in twos, the peppers in fives, and the tomatoes in tens and put them in the boxes, while having a fun conversation with his grandmother. They then took the products to the market and sold them according to the numbers they determined (in groups of 2, 5, and 10). This story's rhythmic counting topic was adapted to the 3rd-grade level. In other storybooks, the mathematics outcomes intended to be given in this way are explained in a fun way that includes daily tasks.

2.5. Data analysis

The measurements obtained in the study were analyzed using the SPSS 26 program. The data obtained from the experimental and control groups were first entered into SPSS, and whether the data met the normality condition was examined. In checking the normality condition, skewness and kurtosis coefficients were checked first. The normality condition is assumed to be met when the skewness and kurtosis values are between –1.5 and +1.5 (Tabachnick & Fidell, 2013). In addition, the normality condition can also be checked with the Shapiro-Wilk test when the number of students in the groups is below 30. When the p (Sig.) value is greater than 0.05, it can be said that the data are normally distributed (Can, 2019). The data of the procedures performed to check the normality condition are shown in Table 4.

Table 4. Results obtained for the control of normality condition

Test	Group	Shapiro-Wilk			Skewness	Kurtosis
		Statistic	df	Sig.		
Mathematics Achievement Test	Experimental Pretest	0.906	19	0.062	-0.790	0.472
	Experimental Posttest	0.947		0.350	-0.751	0.405
	Control Pretest	0.960	20	0.535	0,295	-0.634
	Control Posttest	0.944		0.284	-0.120	-1.185
Attitude Scale	Experimental Pretest	0.929	19	0.169	-0.657	-0.400
	Experimental Posttest	0.951		0.415	-0.630	0.256
	Control Pretest	0.956	20	0.463	-0.279	-0.785
	Control Posttest	0.924		0.117	-0.027	-1.414

According to Table 4, the skewness and kurtosis values of the experimental and control group pretest and posttest scores of the mathematics achievement test and attitude scale are

between –1.5 and +1.5. The p (Sig.) values of the Shapiro-Wilk test results of the achievement test and attitude scale are also greater than 0.05. The fact that the skewness and kurtosis values are between –1.5 and +1.5 and the p (Sig.) values are greater than 0.05 shows that the data are normally distributed. Independent samples t-test was used in the intergroup comparison of the experimental and control groups whose data were normally distributed, and the dependent samples t-test was used in the intra-group comparison. In addition, Cohen's d effect values were calculated to reveal the effect of teaching supported by mathematics stories; these values were interpreted as "0.2 small, 0.5 medium, 0.8 large and above 1 very large" effect (Cohen, 1992).

3. Results

The results of the independent samples t-test used in the analysis of the pretest and posttest scores of the groups' mathematics achievement and attitude scale measurements are presented in Table 5.

Table 5. Independent samples t-test results of the groups' pretest and posttest scores

Situation	Group	Test	n	*M*	sd	df	t	p	d
Mathematics Achievement Test	Experimental	Pretest	19	11	2.82	37	-0.197	0.845	
	Control		20	10.8	3.47				
	Experimental	Posttest	19	14.26	2.55	37	-3.271	0.002*	1.05
	Control		20	11.3	3.06				
Attitude Scale	Experimental	Pretest	19	75.15	13.18	37	-0.118	0.907	
	Control		20	74.6	16.17				
	Experimental	Posttest	19	85.26	10.38	37	-2.576	0.015*	0.82
	Control		20	75.15	13.95				

According to Table 5, there was no significant difference between the pretest scores of the experimental and control groups in the mathematics achievement test and attitude scale [t(37)=–0.197; t(37)=–0.118, p>0.05]. However, there was a significant difference between the posttest scores, and this difference was in favor of the experimental group [t(37)=–3.271; t(37)=–2.576, p<0.05]. In this case, mathematics teaching supported by mathematics stories significantly affected students' mathematics achievement and attitudes toward mathematics. The Cohen's d effect size of 1.05 in the math achievement test for this significant effect can be interpreted as a very large effect, and the Cohen's d effect size of 0.82 in math attitude can be interpreted as a large effect on students.

The results of the dependent samples t-test used in the analysis of the groups' mathematics achievement and attitude scale measurements before and after the application are presented in Table 6.

Table 6. Dependent samples t-test results of the groups' pretest and posttest scores

Situation	Group	Test	n	*M*	sd	df	t	p	d
Mathematics Achievement Test	Experimental	Pretest	19	11	2.82	18	-4.688	0.000*	-1.07
	Control	Posttest	19	14.26	2.55				
	Experimental	Pretest	20	10.8	3.47	19	-0.671	0.510	
	Control	Posttest	20	11.3	3.06				
Attitude Scale	Experimental	Pretest	19	75.15	13.18	18	-3.845	0.001*	-0.88
	Control	Posttest	19	85.26	10.38				
	Experimental	Pretest	20	74.6	16.17	19	-0.135	0.894	
	Control	Posttest	20	75.15	13.95				

According to Table 6, while there was a significant difference between the pretest and posttest scores of the experimental group in the mathematics achievement test [$t(18)=–4.688$, $p<0.05$], there was no significant difference between the pretest and posttest scores of the control group. [$t(19)=–0.671$, $p>0.05$]. The fact that the Cohen d effect size calculated for this significant difference in favor of the experimental group was –1.07 explains that this difference has a very large effect. While there was a significant difference between the pretest and posttest scores of the experimental group in the attitude scale [$t(18)=–3.845$, $p<0.05$], there was no significant difference between the pretest and posttest scores of the control group [$t(19)=–0.135$, $p>0.05$]. The fact that the Cohen d effect size calculated for this significant difference in favor of the experimental group was –0.88 explains that this difference has a large effect.

4. Discussion and Recommendation

In the study examining the effect of mathematics lessons supported by mathematics stories on the mathematics achievement and attitudes towards mathematics of 3rd-grade students, the experimental group was taught mathematics with stories. In contrast, the control group was taught with the method in accordance with the textbook-based education approach. According to the pretest results of the mathematics achievement test and attitude towards mathematics scale, no significant difference was observed between the students. According to this result, it can be said that the levels of mathematics achievement and attitudes towards mathematics of the experimental and control groups were close to each other at the beginning.

When the results between the groups were examined, it was concluded that there was a statistically significant difference in favor of the experimental group at the $p<0.05$ level according to the findings obtained from the posttest of the mathematics achievement test. The effect size of the difference was calculated as 1.05, accepted as a very large effect size by Cohen (1992). When within-group results were examined, mathematics lessons supported by mathematics stories effectively affected students' mathematics achievement. In contrast,

lessons taught with the method in accordance with the textbook-based education approach were not effective, although the average score increased. The effect size of the difference between the pretest and posttest scores of the experimental group in which mathematics teaching was done with stories was calculated as –1.07, accepted as a very large effect size by Cohen (1992). According to these results, it can be said that mathematics teaching supported by stories had a great effect on students' mathematics achievement. This success can be attributed to the fact that the stories of TÜBİTAK publications are appropriate and remarkable for the learning outcomes and are effectively integrated into the lessons. When the books were selected, their suitability for the grade level, language, visuals, and content were examined beforehand, and the stories were included in the process when appropriate to the mathematics topics. Using books with faulty content or having unqualified books may neutralize the learning process instead of supporting it (Flevares & Schiff, 2014; Ward et al., 2017). Therefore, serious preparation and planning should be made to adequately integrate children's literature into the process (Whitney et al., 2017). In the literature, studies show the positive effects of stories on students' mathematics achievement at different levels. The fact that mathematics lessons integrated with illustrated books yielded effective results on 5th-grade students' place value achievement (Durmaz & Miçooğulları, 2021), mathematics achievement (Green, 2013; Katipoğlu, 2019), and "evaluating the solution of the problem" step of problem-solving (Yalçın et al., 2022) supports the results of our study. In addition, this method increases the participation of students with behavioral problems (Whitney et al., 2017) and students from lower socio-economic classes (Young-Loveridge, 2004) in the literature shows that children's literature and mathematics lessons can be integrated. It has also been found that students pay more attention to the lesson in integrated mathematics lessons (Durmaz & Miçooğulları, 2021). However, some studies show that it does not yield effective results on students' mathematics achievement, mathematics association skills, and mathematics self-efficacy (Hassinger-Das et al., 2015; Stone, 2016; White, 2003; Yalçın et al., 2022). Therefore, teacher beliefs should not be ignored when integrating children's literature into mathematics lessons; these adverse effects should be minimized by supporting teachers through professional development programs (Can & Durmaz, 2023; Durmaz, 2022). In these professional development programs, teachers should be informed about what should be considered in book selection, how integration should be done, how students should not be bored with these disciplines, both mathematics and literature, or how one field should not contain elements that suppress the other field, and sample practices should be presented.

According to the results obtained from the attitude towards mathematics posttest between the groups, it was concluded that there was a statistically significant difference in favor of the experimental group at $p<0.05$ level. The effect size of the difference was calculated as 0.82, which is accepted as a large effect size by Cohen (1992). The within-group results show that teaching supported by mathematics stories effectively affects students' attitudes towards mathematics. At the same time, the lessons taught per the textbook-based education approach are ineffective, although the average score has increased. The effect size of the difference

between the pretest and posttest scores of the experimental group in which mathematics was taught with stories was calculated as –0.88, which is accepted as a large effect size by Cohen (1992). These results show that mathematics teaching supported by stories greatly affects students' attitudes toward mathematics. This result can be attributed to the fact that the students had not encountered such a practice before and that this integration was interesting. Similarly, while teaching mathematics with children's literature was effective on the problem-solving attitudes of elementary school 2nd and 3rd-grade students (Cankoy, 2011; Lynch, 2006), contrary to these studies, it was not effective on the attitude scores of middle school 8th-grade students towards problem-solving (Yalçın et al., 2022). Because children's books are used to make lessons more fun and motivate students (Furner, 2017; Keat & Wilburne, 2009; Ruiz et al., 2010). In their study, Can et al. (2020) found that classroom teachers had difficulty in selecting children's books that offer children the opportunity to learn mathematics. However, teachers used the books to attract attention, make lessons fun, and increase motivation. These results support the results of our study. Because children's books from TÜBİTAK publications attracted children's attention, provided them with a different experience, and helped them develop positive attitudes towards mathematics lessons. In addition, in integrating children's literature and mathematics lessons, teachers need to prepare in advance, plan at which stage of the lesson to include these activities, and use time well. The fact that there are researches in the literature that using methods such as Realistic Mathematics Education, STEM, and Montessori in mathematics lessons, doing activity-based practices such as creating digital stories, and playing mind and intelligence games will increase students' attitudes towards mathematics reveals the benefits of integrating mathematics lessons with different methods (Ceylan, 2019; Çopur, 2022; Usta, 2021; Şişman, 2022; Zinderen, 2021). In this study, integrating children's literature into mathematics lessons gave students positive experiences and helped them develop positive attitudes toward mathematics lessons. Based on the results of the study, the following suggestions can be made:

- In selecting books to be used in mathematics lessons, the appropriateness of the content, language, visuals, and achievements to the grade level should be checked.
- Before integrating children's literature with mathematics, it is recommended that the teacher should make a serious preparation.
- It is recommended that the teacher should plan at which stage of the lesson the integration will take place.
- Teachers should use time efficiently when integrating children's literature and mathematics lessons.
- Students should be allowed to touch and discuss the storybooks used in mathematics lessons and spend time with them.
- Students should not be pressured to quickly read the storybooks used in the integration.

Declaration of Conflicting Interests and Ethical Issues

"The authors declare no conflict of interest." The researchers obtained Ethical approval from Afyon Kocatepe University Social and Human Sciences Research and Publication Ethics Committee (Decision Date: 27.01.2023, Decision Number: 2023/26).

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