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The Effect of Traditional Child Games on Fifth-Grade Students' Attitudes Related to Geometry

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Abstract

This study aims to define whether geometry teaching was carried out with the help of traditional children's games for middle school 5th-grade students. In other words, it was tried to understand if it affected students' attitudes towards geometry while keeping traditional children's games alive and their importance in general education and teaching activities. This study was quantitative, and "a pretest-posttest quasi-experimental design with paired control group" was used. The results were handed with the "Attitude Scale Towards Geometry" in the 2021 and 2022 education year. The scale was developed by Ozmen (2019), and while operating this scale, Ozmen benefited from Bindak's (2004) "examination of students' attitudes and behaviors towards geometry." The study group of the research was composed of 42 5th-grade students in total in two classes, including 21 students each. They had education at a state secondary school in the Nusaybin district of Mardin. One of these classes was defined as the experimental group, and the other one as the control group. In the experimental group of the research, the geometry subject of measuring area and length was handled with 5 traditional children's games, and the same subject was taught by using traditional/old methods in the control group. Dependent and independent t-test was used to reveal if the application to the experimental group significantly affected students' attitudes toward geometry. According to the t-tests' result, it may be said that the use of traditional and cultural children's games used in the experimental group developed academic success more than the control group in which the traditional/old methods were used. So, it can be thought that using traditional and cultural child games in geometry lessons developed students' academic success.

***Keywords*:** Traditional child games, Attitude, Game, Geometry.

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Geleneksel Çocuk Oyunlarıyla Yapılan Öğretimin 5. Sınıf Öğrencilerinin Geometri Tutumlarına Etkisi

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Öz

Bu çalışmanın amacı ortaokul 5. sınıf öğrencilerine yönelik geleneksel çocuk oyunları yardımıyla geometri öğretiminin yapılıp yapılmadığını belirlemektir. Başka bir deyişle geleneksel çocuk oyunlarının yaşatılmasında öğrencilerin geometriye yönelik tutumlarına ve genel eğitim-öğretim etkinliklerindeki önemine etkisinin olup olmadığı incelenmiştir. Bu çalışma nicel bir çalışma olup "eşleştirilmiş kontrol gruplu ön test-son test yarı deneysel tasarım" kullanılmıştır. Veriler 2021 ve 2022 eğitim-öğretim yılında "Geometriye İlişkin Tutum Ölçeği" ile toplanmmıştır. Ölçek Özmen (2019) tarafından geliştirilmiş olup, Özmen bu ölçeği uygularken Bindak'ın (2004) "öğrencilerin geometriye yönelik tutum ve davranışlarının incelenmesi" adlı çalışmasından yararlanmıştır. Araştırmanın çalışma grubunu, Mardin'in Nusaybin ilçesindeki bir devlet ortaokulunda öğrenim gören 21'er kişilik iki farklı 5. sınıftaki toplam 42 öğrenci oluşturmuştur. Bu sınıflardan biri deney grubu, diğeri ise kontrol grubu olarak tanımlanmıştır. Araştırmanın deney grubunda alan ve uzunluk ölçümü geometri konusu 5 geleneksel çocuk oyunuyla işlenirken, kontrol grubunda aynı konu geleneksel/eski yöntemlerle işlenmiştir. Deney grubuna yapılan uygulamanın öğrencilerin geometriye yönelik tutumları üzerinde anlamlı bir etkisinin olup olmadığını ortaya koymak için bağımlı ve bağımsız t testi kullanılmıştır. T testi sonucuna göre deney grubunda kullanılan geleneksel ve kültürel çocuk oyunlarının kullanımının, geleneksel/eski yöntemlerin kullanıldığı kontrol grubuna göre akademik başarıyı daha fazla geliştirdiği söylenebilir. Dolayısıyla geleneksel ve kültürel çocuk oyunlarının geometri derslerinde kullanılmasının öğrencilerin akademik başarısını arttırdığı düşünülebilir.

Anahtar Sözcükler: Geleneksel Çocuk Oyunları, Tutum, Oyun, Geometri.

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Introduction

"Educational game method is thought to be a teaching method. So it is primarily used for making lessons enjoyable. It is applied in the consolidation phase after knowledge acquisition" (Songur, 2006, p. 8). If it is tried to understand a culture, it is necessary to examine the traditional games played by the children of this society. The relationship between child games and culture is also significant. Because traditional child games are the production of culture, on the other hand, it is known that children's habit of imaginary games may have taken them away from their warm nature of families, true social stakeholders, and local and learned culture and directs them to be members of an artificial and virtual world. It is known that culture is sometimes used in return for education (Toker, S., & Baturay, M. H., 2016). Because of the rapid development of technology, today's children, known as "Generation Z," generally known as "zoomers," is the demographic group "succeeding millennials," and preceding "Generation Alpha",”" often shortened to "Gen Z" may be unable to play the games that their elder brothers and sisters and ancestors played when they were children and young. In this way, they may move away from natural games and become estranged from their local cultural values. This situation obstructs children from the developmental gains of play. Childrens' social, psychological, and cultural developments, as well as physical and biological growth, depend on these activities. Today, traditional child games have been replaced by tabletop virtual and violence, and dangerous games that do not require movement and physical activities and hinders the child's development (Sakamoto, 1994, pp. 21-42).

The education given to individuals to meet their learning necessities is also changing, and these changes in return for developments have also been observed in this area clearly. Instead of presenting all the new information ready-made, it aims to ensure the improvement of youth in terms of cognitive, affective, and psycho-motor skills (Güneş, 2010). These science, technology, and education developments bring new understandings and teaching methods. Recently, student-centered approaches and methods have also been emphasized and tried to be used in teaching and learning. All dimensions and areas of social life are affected by innovations in education. It has also affected mathematics teaching and especially mathematical knowledge. Children worldwide have been playing traditional games from the past to the present.

Childhood means play from beginning to end. Because play is one of the basic needs of the child. They spend most of their time playing games. In other words, life is a kind of play for them. Playing especially traditional games allows children to acquire preliminary information about the real world. This preliminary knowledge can lighten the way for all sciences, such as those related to language, art, mathematics, and science, that they will learn over time. It can also help children find solutions to many problems that they may encounter in real life or in the positive or negative classroom environment. While games resemble activities done for, having fun and good times, mathematics is understood as a serious completing lesson (Uğurel, 2003). However, games are not only the activities that keep children busy in childhood and a set of concepts that can be taught through textbooks, but also a lively and alive process (Demir, 2016). If human behaviors and manners are deeply analyzed, they may be understood as all geometry and mathematical productions. It means real or non-real life consists of mathematical strategies that are derived from games. Generally, it can be said that the mathematical operations used by children in daily life excite and make them wonder. As it can be seen and understood, mathematics has an important place in the children's daily life, school life, and every environment in which they play and have fun.

It has become necessary to use different methods and strategies in learning. Geometry course/science is an essential subbranch of mathematics that makes students comprehend, represent the world,, and analyze the problems to solve and visually understand the world. The world is only an example of advanced calculations (Struchens, Harris, & Martin, 2001, pp. 41-44). Geometry is one of the main branches of mathematics, including shapes, space, spatial shapes, points, lines, planes, and their relations, as well as the structure of geometric shapes, including volume, area, length, angle, and area. Attitude refers to the manner explained in Turkish (TDK [Turkish Language Institution], 2022). Attitude related to geometry is a kind of manner and behavior about understanding the world. In fact, it directs and controls the student's feelings, thoughts, and behaviors for the geometry activities, the geometry subject, the teacher, and the messages derived from geometry. In other words, geometry is

accepted to be good or bad, as well as the beliefs about the benefits of any subject. Because it may be possible to analyze the environment with the geometrical calculating structure (Kaba, Boazlyan, and Daymaz, 2016, p. 336). Personal and individual attitudes influence the students' learning style and success (Bindak, 2004, pp. 8-14). Affective examination of geometry topics is crucial and important for learning and instruction (Ünlü & Ertekin, 2018, p.20). It is a kind of result derived from measurement and interpretation. In order to achieve the desired goals in geometry, it is crucial in this context to determine students' attitudes about geometry. There are many international quantification and consideration studies. According to international examinations such as PISA and TIMMS, as well as national examinations such as LGS and YKS, Türkiye does not achieve the desired level of mathematics success. It is believed that a lot of students in LGS and YKS do not succeed in finding correct answers for any questions in the mathematics course.

Traditional and national child games have significant effects on all aspects of a child's development and growth. A child's language development is controlled and directed by nursery rhymes and lullabies. So, the child's physical development is directly affected by the game's jumping and running movements. Thesese social and cultural achievements are affected by greeting at the beginning of the game, such as congratulating the winner, combating together, and saying farewell in the conclusion. A child who internalizes his or her problems in daily life reflects on the outside in the game, allowing the child's family and teachers to learn more about him or her. A child's personality develops through these kinds of plays. In all games, a child's constant thinking and cognition develop when he or she plans to solve problems. In fact, developing the abilities of problem-solving is an important gain (Altunay, 2004, pp. 17-26). So, it may be thought that all mathematics teachers must teach by using more children's games along with the process.

In geometry and mathematics education, it is understandable that behavior-change is necessary and constant. Teaching without modern methods and techniques is the leg behind contemporary teaching approaches. Lessons related to game-based activities may be viewed as an alternative technique and method. It is impossible to understand the reason and results of natural events in the world without geometry (Aydın, 2021, p.3). These courses, which play a critical role in daily life, evolve and change with humanity. The importance of mathematics education has grown due to rapid life changes, technological advancements, and current needs. In that case, mathematics is a clear technology language everybody uses (Gelişen, 2017, p.17).

When the literature is analyzed, it was understood that the plurality of studies have focused on the pleasure and benefits of games supporting learning in mathematics education. Dündar (2022) wanted to determine the combining area and length measurements. Affective topics play a very important role in mathematics education. So, it is accepted that students' beliefs influence their behaviors. For that reason, identifying their beliefs may be possible. Because traditional games in cultural format show and shape their manner and behaviors (Duatepe & Paksu, 2013, p. 215). According to Turul & Kavici, (2002) the usage of child games during mathematics education has also increased students' interest in the subject. However, a lot of studies were organized on the effects of traditional and cultural child games on achievement and attitudes. There is insufficient research on the effects of traditional child games on attitudes. Therefore, there is a need for research to understand the effect of traditional child games on students' attitudes toward geometry. When traditional games were examined, it was understood that they were generally played in open areas. There are many group games, and the social relations are close. But when modern games are examined/played, it is seen and known that they are generally played in closed areas ,there are mostly individual games, and social relations are weak (Sormaz and Yüksel, 2012

Problem and Sub-Problems in the Research

This experimental research is necessary to determine whether teaching traditional child games affects the attitudes toward learning geometry of secondary school 5th-grade students. Soon after having the data of this research, it may be said that one of the basing aims is to effect the abstract subjects of mathematics with traditional child games, to visualize the subject, to learn with pleasure through doing and preserve the forgotten traditional child games. As a result, it is also necessary to answer the problem question; *"Does teaching with traditional children's games affect fifth-grade students' attitudes toward*

geometry?" In the process of answering this problem, the question above and subquestions below were formulated and tried to answer.

1) Is there a statistically significant difference between the results of the attitude scale
2) administered to the experimental and control groups of students prior to the research?
3) What about the difference between the pre-study attitude scale and the post-study attitude scale for the experimental group of students who were taught traditional children's games and their attitudes towards geometry?
4) What can be said about the difference between the pre-test and post-test attitudes administered to the students in the control group before and after the research?
5) At the conclusion of the research, is there a statistically significant difference between experimental and control group students' attitudes on the geometry attitude scale post-test?

Method

This study included a *"pre-test-post-test, quasi-experimental design with paired control groups"* to find out if teaching geometry subjects with the help of traditional child games had a meaningful influence on students' behaviors and manners. Due to the structure and location of the research and various problems, such as weather, it was extremely challenging to form identical or comparable participant groups. The researchers randomly assigned the first student groups as the experimental group and the second as the control group. This formatted research is called experimental research (Büyükoztürk, Çakmak, Akgün, Karadeniz, and Demirel, 2008). The pre-test is applied simultaneously to both groups. The control group maintains the standard curriculum, i.e., lessons are taught by using the conventional approach. This model's pre-test helps to find out the similarities between the chosen participant groups prior to the experiment and to interpret the results of the post-test administered after the experiment. This model is successful in finding out the differences between these two control and experimental participant groups (Ozmen & Karamustaolu, 2019, p. 209).

Research Design

This study is quasi-experimental in nature because it investigated whether traditional children's games had an effect on students' attitudes and academic success in mathematics and geometry. ***"The pre-test and post-test method"*** was utilized to determine the difference between using traditional child games and traditional teaching methods. Like a true experiment, "quasi-experimental research" attempts to show that there is "a cause-effect relationship" between the dependent and independent variables. On the other hand, a quasi-experiment does not rely on random assignment, unlike a true experiment. The subjects are divided into groups according to non-random variables.

Research Sample / Study Group

In this research, the 5-D class was chosen as the experimental and 5-C class was the control group and each class consisted of 21 5th-grade students attending a state secondary school in the Nusaybin district of Mardin during the 2021-2022 academic year, which were randomly defined as the study group. So, these selected groups' primary school achievement averages were also comparable according to definite variables such as their success points in the previous academic years. At the beginning of this study, both groups named experimental and control groups were given and applied the geometry attitude scale. ***"Geometry Attitude Scale"*** was applied to these groups as a post-test to determine the difference between the groups in the and of the study.

Research Instruments and Process

The data of this study were collected with the written consent of the students' families during the second half of the 2021-2022 academic year in 5 weeks and 22 hours. The ***"Attitudes Towards Geometry Scale"*** was used to notice the attitudes of students towards geometry. One of the researchers must be an expert on children's games. In this study one of the researchers is an expert on this area because of having some published studies.

In this study, the *"Attitude Scale Towards Geometry"* scale was answered by the participants. The scale was developed by Ozmen (2019). While developing this scale, Ozmen benefited from Bindak's (2004) "examination of students' attitudes and behaviors towards geometry". The *"Attitudes to Geometry Scale (GTS)"* developed by Bindak (2004) having 25 items and is a *"5-point Likert scale (1 = I strongly disagree, 5 = I strongly agree)."* With the addition of geometry to the fifth-grade curriculum, students' attitudes towards geometry were assessed. And also, there are 9 positive and 16 negative items in the scale, which was used to collect the research data. Bindak (2004) calculated/studied the scale's validity and reliability analysis using Cronbach alpha data, such as internal consistency, using the item-remaining-total correlation techniques. The calculation revealed the "Cronbach Alpha coefficient to be 0.94 and the test half reliability to be 0.88. FAO includes "interest" sub-dimension (M6, M18, M21, M22), "avoidance" sub-dimension (M1, M9, M14, M17, M20, M24, M25), "anxiety" sub-dimension (M2, M5, M11, 12-13, 16), and "pleasure-enjoyment" sub-dimension (M2, M5, M11, 12-13, 16). (M3, M4, M7, M8, M10, M15, M19, M23)." *"The Cronbach Alpha Internal Consistency Coefficients"* were 0.88 for the entire scale, 0.91 for the "pleasure-enjoyment" sub-dimension, 0.86 for the "anxiety" sub-dimension, 0.81 for the "avoidance" sub-dimension and 0.81 for the "interest" sub-dimension in the analyses. Bindak (2004) conducted the study for the FAO. It was also determined to be 0.66. In the study conducted by Ozmen (2019), the first 16 of the 20-item scales were designed to detect positive attitudes, while the last 4 were designed to detect negatives. A high score on the inventory indicates a positive attitude about geometry. On the other hand, the low score indicates that the students have negative attitudes toward geometry. At the beginning and end of the study, the experimental procedure was applied, such as a pre-test and post-test, to define experimental and control groups. *"The pre-test Cronbach Alpha"* values according to the Experiment I, Experiment II, Experiment III, and control groups *"Geometry Attitude Scale"* were 0.84, 0.90, 0.88, and 0.86, while the post-test *"Cronbach Alpha"* values were 0.87, 0.82, 0.85, and 0.90. Examining these values (>.70) demonstrated that the measurements provided by the scale were also accurate.

Data Analysis

In the second academic year of 2021-2022 the ***"Attitude Scale Towards Geometry"*** was carried out on the control and experimental groups. Then, in the experimental group, the lesson was taught with traditional children's games. In the control group, the lesson was taught with teaching methods within the framework of the current program, such as presentation, invention, research, and analysis strategies and the methods and techniques of these strategies. At the end of the process, the attitude scale was applied to the students in both groups. The obtained results were entered into the computer system with the help of the SPSS 23.0 program and analyzed within this framework. *"Shapiro-Wilk Test"* was used when evaluating the collected data because each participant group was less than 30. Parametric tests were used because the data were distributed normally depending on the data of the *"Shapiro-Wilk Test."* In analyzing the results handed and according to the research questions, the analyses were made using independent and dependent samples t-test of parametric tests. In interpreting the analysis results, the significance threshold was set as 0.05.

Ethical Procedures

The ethics committee permissions were obtained with the letter dated 18.05.2022 and numbered E-88179374-302.08.01-2200148507 of the "Social and Human Sciences Scientific Research and Publication Ethics Committee of Atatürk University Institute of Educational Sciences."

Results

In this part of the research, the related data collected and the reasons derived from their analysis were tried to be discussed. The results and answers of this study's main and four subproblems were evaluated after being presented in tables and graphs in a definite order.

According to the answer to the first subproblem/question, *"Is there a significant difference between the pre-study results of the geometry attitude scale administered to the experimental and control groups?"* The data were analyzed by using the t-test for independent participants/samples. Because it was planned to find out whether the data had a meaningful difference between the average attitude points of the two groups prior to this study. The results are presented in Table 1.

Table 1.

Results of the Attitude Scale Given to Students in the Experimental and Control Groups Prior to the Research

Test	Groups	N	$\bar{x}$	S	t	sd	p
Pre-test	Experimental Group	21	48.14	4.96	1.262	40	.214
	Control Group	21	45.71	7.28			

The difference between the pretest-related attitude score points in the experimental participant group's students (x=48.14) and the control group's pre-test mean scores (x=45.71) was not statistically significant according to the results handed [t(40)=1.262 p>.05]. In line with the findings, the two groups' pre-experiment readiness and attitude levels were equal. In other words, the distributions were homogeneous and normal.

The following sub-problem question was ***"Is there a significant difference between the pre-test and post-test attitudes of the experimental group students who were taught traditional children's games?"*** In order to reach the targeted data of this sub-problem question and to discover if there was a statistically meaningful difference between the used pre-test and post-test mean scores of the experimental group's students, dependent samples were tried to be calculated using the *"t-test."* The test results applied are shown in Table 2.

Table 2.

Results of the Geometry Attitude Scale Pre-Test and Post-Test Administered to Students in the Experimental Group Before the Study

Group	Test	N	$\bar{x}$	S	t	sd	P
Experimental Group	Pre Test	21	48.14	4.96	6.179	20	.000
	Post Test	21	53.95	3.72			

When looking at the dependent sample t-test, the difference between the mean score of t-test (x=48,142857) and the post-test's average score (x=53,952381) of the experimental participant students was statistically meaningful through the direction of the post-test. [t(20)].)=6.179 p.05].

As well as understanding from the results of teaching with traditional children's games were positively influencing students' behaviors and manners related to geometry. In other words, student attitudes changed at the end of the course in which traditional children's games were used. Teaching with children's games affects students' mathematical attitudes and behaviors.

The next sub-problem was, *"Is there a significant difference between the attitudes towards geometry measured in the pre-test applied to the students in the control group and the attitudes towards geometry measured in the post-test applied after the research?"* When the answers were examined, it was understood that a meaningful difference occurred between the pre-tests and post-tests' results. The results are shown in "Table 3." In accordance with the dependent samples' t-test, the difference between the average pre-test score of the experimental group's students (x=48.142857) and the post-test score's averages (x=53.952381) was statistically significant in the post-test direction [t(20)].)=6.179 p.05].

Table 3.

Findings Concerning the Attitudes of the Control Group Students on the Pre-Test Administered before the Research and the Post-Test Administered Following the Research

Group	Test	N	$\bar{x}$	S	t	sd	P
Control Group	Pre-Test	21	45.71	7.28	4.106	20	.001
	Post -Test	21	50.19	5.47			

When the dependent sample t-test data for Table 3 were evaluated, it could be thought that there was a statistically meaningful difference between the pre-test attitude score average (x=85.66) and the post-test attitude score average implemented to the control group participants at the beginning of the research (x =45.71) [t(20)=4.106 p>.05]. According to these results, it can be claimed that the attitudes of the experimental group's students who were taught using the traditional method also changed.

When the answers to the third sub-question, "*Is there a significant difference between the geometry attitude scale post-test attitudes of the participant students in the experimental and control groups?"* were evaluated, it was understood that there was a very important difference. In order to define whether there was an important and meaningful difference between the post-test attitude scores of the experimental group students trained with traditional children's games and the post-test attitude points of the control group's students trained with the traditional method, the t-test was applied to independent samples, and the results were given in Table 4.

Table 4.

Research Results Comparing the Post-Test Attitude Scores of Students in the Experimental Group and the Control Group

Grup	Test	N	$\bar{x}$	S	t	sd	p
Experimental Group	Post Test	21	53.95	3.72	2.605	40	.013
Control Group	Post Test	21	50.19	5.47			

In accordance with the independent sample t-test results in "Table 4," there was a statistically meaningful and important difference between the post-test's attitude mean scores of the participant experimental group (x=53.95) and the post-test's attitude score averages of the students in the control group (x=50.19). [t(40)=2.605 p>.05]. While looking at the results, there was an important difference between the attitude scores of the students in the experimental group, whose mathematics and geometry teaching was carried out with traditional children's games, and the students in the control group who were taught the same geometry subjects with traditional and classical methods. The difference found out was also in favor of the experimental group. In other words, attitudes changed in both groups. Still, the attitudes of the participant experimental group students towards geometry carried out with traditional children's games changed at a higher rate and in a positive way.

Discussion, Conclusion, and Recommendations

In this study, it was planned whether the use of traditional children's games in geometry teaching to fifth-grade students in secondary school affects their geometry learning attitudes or not. The results were summarized, and various suggestions were made so that they could make evaluations with the answers given to the sub-problems structured for this purpose and the collected data.

In this context and in accordance with the dependent t-test's results, there was a very important difference between the pre-test and post-test scores of the experimental group taught geometry using traditional child games. So, it may be said that teaching geometry with traditional children's games affected their attitudes/manners toward geometry subjects. It was sighted that this difference was against the pre-test. Based on the difference here, it was revealed that the inclusion of cultural child games in

the learning process and classroom environment in their teaching and learning experiences positively affected students' attitudes towards geometry. Therefore, it can be said that when a geometry lesson was given to the experimental group with traditional children's games, the attitudes of the participant students towards geometry developed positively.

On the other hand, when the dependent t-test results were examined, a meaningful difference emerged between the geometry attitude scale's pre-test implemented to the control group students at the beginning of the research and the post-test applied at the end of the research. At the same time, a critical difference between pre-test and post-test data occurred in the control group.

Due to the results of this research, a statistically meaningful difference found in the independent sample t-test performed on the post-test data of the experimental and control groups. In other experimental studies, apart from this study, it can be claimed that traditional and educational children's games positively affect students' learning/success/achievement. In almost all of the studies, the attitude scores of the experimental group increased significantly after the application process compared to the pre-experiment. In other words, teaching with traditional children's games had a more positive effect on students' attitudes than using traditional methods. More improvement was achieved in the teaching activities using traditional children's games used for the experimental group and then compared to the control group.

Aksoy (2010), Takcak (2012), Arslan (2012), and Kandil (2016) were similarly involved with this kind of study, and they were trying to find out the effect of video games on attitudes. According to the research data achieved by Arslan, it was ineffective in changing student attitudes. The studies of Kandil, Takcak, and Akçay revealed similar results to this study. It was determined that games changed the attitudes of 6th graders in Aksoy's study, 8th graders in Takcak's study, and 7th graders' in Kandil's study. In his research, Uğurel (2003) examined the opinions of teachers and pre-service teachers regarding teaching mathematics through games. In this research, it was observed that teachers and pre-service teachers stated that teaching with games increased students' interest in the lesson, improved their problem-solving skills, that they were active in lessons, established healthy communication, increased motivation, and that games enabled the students to learn information permanently and quickly. Similar studies were conducted by Hoşgör (2010), Güneş (2010) and Usta et al. (2016). In these studies, teachers and pre-service teachers stated that using traditional child games in mathematics teaching provides a better understanding of the subjects, provides permanent learning, motivates students positively, enables them to socialize, and contributes to their mental development. At the same time, it was observed that students developed positive attitudes toward mathematics, focused on the lesson, and actively participated in it thanks to the games. In the study conducted by Tural (2005), the effect of teaching subjects such as mathematics with the help of games and activities in primary school was examined on students' achievements and attitudes. According to the results obtained, it was observed that teaching with games and activities affected students' attitudes towards the lesson positively. Games increased interest in the lesson and the subject, made students active, and increased sharing among students. In his research, Demir (2016) examined the influence/effect of teaching mathematics through child games on the achievement and retention of first-grade students. Therefore, it was concluded that the game teaching method significantly affected the students' total achievements and learning retention in the mathematics course. In the study conducted by Galiç (2020), it was observed that teaching enriched with games positively affected students' attitudes and motivation toward mathematics lessons. In the research conducted by Kılıç (2010), "the effect of teaching with games on the success of the acquisition of operation skills in the first grades of primary school" was investigated. In the research, there was an increase in the success level of the group to which game teaching was applied and observed. In some other studies on teaching mathematics through games (Kebritchi and DG, 2008; Ashirbayev and DG, 2015; Boz, 2018; Galiç, 2020; Denli, 2021), it was observed that the game teaching method had a significant effect on the academic success of students. Therefore, all these studies support the research results.

As in many studies conducted in this area, the effect of cultural and traditional children's games on the geometry attitudes of fifth-grade primary school students was investigated. Experimental design, one of the quantitative research approaches, was used. Based on the data obtained in the study, some suggestions were made for future studies.

Suggestions for Researchers

- In this study, 5 activities representing traditional children's games were used. Teaching activities related to various subject areas can be enriched using more effective traditional children's games.
- The sampling group of this study is 5th-grade primary school students. More research can be designed and conducted at different grade levels of students on different subjects.
- This study, which was conducted in the Nusaybin district of Mardin province, was conducted in a public high school. The findings and results of the study are limited to the participant study group students and the data handed from them with the data collection tool. Researchers who will determine the effect of teaching conducted using traditional children's games on attitudes can be encouraged to conduct studies in more schools and with larger sample sizes.
- Longer-term comparative studies can be conducted with larger and more different age groups.
- As stated this study examined and evaluated the effect of teaching with traditional child games about students' attitudes and manners towards geometry.

References

Aksoy, N. C. (2010). *The effect of game-supported mathematics teaching on the development of elementary school 6th grade students' success, achievement motivation, self-efficacy and attitudes about fractions. (*Unpublished Master's Thesis). Gazi University, Institute of Educational Sciences, Ankara.

Altunay, B. (2004). *The effect of game-supported mathematics teaching on student achievement and retention.* (Unpublished Master's Thesis). Gazi University, Institute of Educational Sciences, Ankara.

Arslan, O. (2012). *Investigation of primary school mathematics teacher candidates' beliefs and self-efficacy perceptions regarding the use of origami in mathematics education*. (Unpublished Master's Thesis). Middle East Technical University, Institute of Social Sciences, Ankara.

Bindak, R. (2004). *Geometry attitude scale reliability validity study and an application.* (Unpublished PhD Thesis). Dicle University, Institute of Science and Technology, Diyarbakır.

Boakes, N. (2008). Origami-mathematics lessons: Paper folding as a teaching tool. Mathidues, 1(1*)*, 1-9. Retrieved from. https://www.fau.edu/education/ centersandprograms/ mathitudes/documents/20080901bMathitudesOct08revisionFinalVersionforpublicationOct242008.pdf.

Büyüköztürk, Ş., *Kılıç Çakmak*, E., *Akgün*, Ö.E., *Karadeniz*, Ş. & *Demirel*, F. (2008). Bilimsel araştırma yöntemleri [Scientific Research Methods] (14th Ed.). Ankara.

Denli, M. (2021). *Oyunlarla matematik öğretiminin tam sayılar konusunda ortaokul 7. sınıf öğrencilerinin matematik başarısına etkisi [The effect of teaching mathematics through games on the mathematics achievement of 7th grade secondary school students on integers].* (Unpublished Master's Thesis). Gazi University, Institute of Educational Sciences, Ankara.

Demir, M. R. (2016). *Farklı oyun türlerine dayalı matematik öğretiminin 1. sınıf öğrencilerinin erişi ve kalıcılık düzeylerine etkisi. [The effect of mathematics teaching based on different game types on the achievement and retention levels of 1st grade students.].* (Unpublished PhD Thesis). Necmettin Erbakan University, Institute of Educational Sciences, Konya.

Developing, A. (2017). A teaching experiment on using origami and nonverbal proofs in teaching triangles in 9th grade.

Dundar, B. (2022). *The effect of teaching with origami games on success in measuring 5th grade area and length.* (Unpublished Master's Thesis). Ataturk University, Institute of Educational Sciences, Erzurum.

Duatepe-Paksu, A. (2013). Geometry Readiness, Thinking Levels, Self-Efficacy and Attitudes towards Geometry of Primary Teacher Candidates. *Pamukkale University Faculty of Education Journal, 33*(33), 203-218. doi: 10.9779/PUJE585.

Galiç, S. (2020). *Oyun ögeleri ile zenginleştirilmiş matematik etkinliklerinin öğrencilerin başarı, tutum ve motivasyonları üzerine etkisinin incelenmesi. [Examining the effect of mathematical activities enriched with game elements on students' achievement, attitude and motivation.].* (Unpublished Master's Thesis). Hacettepe University, Institute of Educational Sciences, Ankara.

Güneş, G. (2010). *İlköğretim ikinci kademe matematik öğretiminde oyun ve etkinliklerin kullanımına ilişkin öğretmen görüşleri (Kars ili örneği). [Teacher opinions on the use of games and activities in secondary school mathematics teaching (Kars province example)].* (Unpublished Master's Thesis). Kafkas University, Institute of Social Sciences, Kars.

Hoşgör, A. (2010). *İlköğretim 1. sınıf öğretmenlerinin matematik derslerinde oyun etkinliklerinin kullanımına ilişkin görüşleri. [First grade primary school teacher's opinion about using game activities in mathematic courses].* (Unpublished Master's Thesis). Çukurova University, Institute of Social Sciences, Adana.

Kaba, Y., Boğazlıyan, D., & Daymaz, B. (2016). Attitudes and self-efficacy of middle school students towards geometry. *The Journal of Academic Social Science Studies, 52*(Winter-I), 335-350. doi: 10.9761/JASSS3727.

Kebritchi, M., Hirumi, A., & Bai, H. (2010). The effects of modern mathematics computer games on mathematics achievement and class motivation. *Computers and Education, 55*(2), 427-443.

Kılıç, A. Z. (2010). *İlköğretim 1. sınıf matematik dersindeki işlem becerilerinin kazandırılmasında oyunla öğretimin başarıya etkisi [The effect of teaching with games on success in gaining operational skills in primary school 1st grade mathematics course].* (Unpublished Master's Thesis). Celal Bayar University, Institute of Social Sciences, Manisa.

Kandil, S. (2016). *Investigation of the effect of inquiry-based teaching enriched with origami activities on secondary school seventh grade students' achievement in reflection symmetry, their attitudes towards geometry course and their self-efficacy perceptions towards geometry.* (Unpublished Master's Thesis). Middle East Technical University, Institute of Social Sciences, Ankara.

Krier, J. L. (2007). Mathematics and origami. the ancient arts unit. Retrieved from, https://fliphtml5.com/nwht/wwea.

MEB Starts Mathematics Mobilization. (2022, 2 March). Retrieved from, https://www.meb.gov.tr/meb-matematik-seferberligi-baslatiyor/haber/25386/tr.

Ministry of Education. (MEB). (2018). Mathematics Course (Primary and Secondary School 1, 2, 3, 4, 5, 6, 7 and 8th Grades) Curriculum. Ankara: MEB Publications.

Özdişçi, S. & Katrancı, Y. (2019). Developing an attitude scale towards geometry at secondary school level. *Kastamonu Journal of Education, 27*(4), 1563-1573. doi: 10.24106/kefdergi.3152.

Özmen, H., & Karamustafaoğlu, O. (Edt.)(2019) Research Methods in Education. (2nd Edition). Pegem Academy, Ankara.

Sakamoto A. Video game use and the development of sociocognitive abilities in children: Three surveys of elementary school students. *J Appl Soc Psychol.* 1994; *24*(1), 21–42.

Songur, A. (2006). *The effect of learning the subject of letter expressions and equations through games and puzzles on students' mathematics achievement levels.* (Unpublished Master's Thesis). Marmara University, Istanbul.

Sormaz, F. & Yüksel, H. (2012). *Değişen çocukluk, oyun ve oyuncağın endüstrileşmesi ve tüketim kültürü. [Changing childhood, industrialization of games and toys and consumer culture]. Gaziantep University Journal of Social Sciences, 11*(3), 985- 1008.

Struchens, M. E., Harris, K. A., & Martin, W. G. (2001). Assesing geometric and measurement understanding using manipulations. *Mathematics Teaching in Middle School, 6*(7), 402-405. doi: 10.5951/MTMS.6.7.0402.

Takacak, M. (2012). *The effect of origami activities on the academic achievement of 8th grade students in the triangle unit and their attitudes towards geometry.* (Unpublished Master's Thesis). Kastamonu University, Institute of Science and Technology, Kastamonu.

Toker, S. & Baturay, M. H. (2016). Antecedents and consequences of game addiction. *Computers in Human Behavior, 55*, 668-679.

Tugrul, B. & Kavici, M. (2002). The art of folding paper and learning. *Pamukkale University Journal of Education Faculty, 1*(11), 1-17. Retrieved from, https://dergipark.org.tr/tr/pub/pauefd/issue/11132/133137.

Tural, H. (2005). *İlköğretim matematik öğretiminde oyun ve etkinliklerle öğretimin erişi ve tutuma etkisi. [The effect of teaching with games and activities on achievement and attitude in primary school mathematics teaching].* (Unpublished Master's Thesis). Dokuz Eylül University, Institute of Educational Sciences, İzmir.

Uğurel, I. &Moralı, S. (2008). Matematik ve oyun etkileşimi [Mathematics and game interaction]. Journal of *Gazi Educational Faculty, 28*(3), 75-98.

Ünlü, M. & Ertekin, E. (2018). A study of developing a belief scale for geometry for middle school students. *Kastamonu Journal of Education, 26*(1), 39-48. doi: 10.24106/kefdergi.346334.