



USE OF EDUCATIONAL GAMES WITH RECYCLED MATERIALS IN ENGLISH TEACHING

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Abstract:

Games are important in today's learning environment. A teacher needs to enrich teaching with a variety of techniques. In this study, it is aimed to get the opinions of primary school 2nd grade students about teaching "animals" subject using games with recycled materials. The study was conducted using a quasi-experimental design with pretest – posttest control group. A pretest - posttest was used as a data collection tool and also a game evaluation form and a semi-constructed interview with teacher were used to get the opinions of the students and the teacher participating in the research. As a result of the research, pretest and posttest results of the students showed that the game had a very positive effect on the learning and the opinions of the teacher and students showed that this game had a positive atmosphere and students had a lot of fun while learning.

Keywords: educational games, recycled materials, learning English

1. Introduction

In today's learning environment, a teacher cannot expect students to speak the language actively in an environment where students only listen to him or where he does not encourage their participation in the lesson. However, a teacher should encourage students to participate in the lesson and create an active learning environment. Games can be used as an effective learning tool in creating an environment where students can participate.

Games play an important role in the development and education of the children. By playing games, children realize what is going on around them, develop themselves

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and learn by having fun. They get to know how to research, acquire new information, rearrange and structure their knowledge by playing games (Ramazan, 2013: 2.). A game is one of the means by which children express themselves in the most comfortable and free way. A child feels independent and free while playing. Especially primary school children need to play (Gökbüyük and Yumuşak, 2014: 675; Pehlivan, 1997: 80).

Educational games; are all the activities in which the students participate willingly and with pleasure, have the educational and teaching purposes, require special materials, have their own rules; consist of individual or group, competitive or collaborative activities. Any game serving the goals of education and teaching can be considered as an educational game (Tural, 2005: 129). Educational games should be learning oriented, simple, interesting, attractive and useful for reinforcing what students have learned (Ülküdür and Bacanak, 2013: 30).

Primary school students tend to learn more with concrete terms due to their age and they are more inclined to learn by doing and playing games. Therefore, teachers should try to use games in teaching the subjects that need to be learned and enrich teaching with games. Games will enable students to learn before they know it while having fun as long as they are applied appropriately and effectively. Games are considered as the centre of the education especially in the early childhood and they are used as an effective tool in the education process (Koçyiğit and Baydilek, 2015: 4). Ramazan (2013) states that with the game-based teaching, games can be used as a tool in the development of children and environments supported by game materials can be beneficial for children (Ramazan, 2013: 2). Thus, in order to benefit from educational games effectively; teachers should use a game suitable for the purpose of education, pay attention to the time and rules of the game and give the students chance to make mistakes and enjoy learning (Güneş, 2015: 784-785).

Materials that can easily be accessed and obtained by both teachers and students, so to speak "recycled materials", can be included to the educational environment and be used in an educational game. The biggest advantage of this type of materials is its low cost. Old cardboards, boxes, used items, bottle or jar lids, toilet paper rolls, thread, scraps of fabric, etc. are some examples of such materials. This type of materials, which Mirzeoğlu (2015) defines as open-ended materials, are more instructive in terms of the active participation of the student in the learning process by using their own creativity. Students can create countless different products using such materials and they can boost both their creativity and their confidence even more (Mirzeoğlu, 2015: 3; Neill, 2013). Children, who learn to produce something new using recycled materials, will thus be more sensitive to the environment and gain awareness that a wide variety of recycled materials can be recycled to the nature and used for a different purpose (Zembat, Tosun, Çalış and Yılmaz, 2020: 21). The appropriate use of recycled materials from students' point of view is important for them to realize their own creativity by using their imaginations. For this reason, materials need to be attractive and suitable for the level of the students (Karabay, 2020: 122). In this research, the effect of recycled materials on teaching "animals" subject of the 2nd grade was examined. In this context, the students participating in the research were asked to make an animal model using recycled

materials and then present the animals they made. For this purpose, the following questions were asked:

- What is the effect of animal models made with recycled materials on teaching "animals" in English?
- What are the opinions of the students, participating in the research, about the effectiveness of the lesson which includes games with recycled materials?
- What are the opinions of the students, participating in the research, about the use of recycled materials?
- What are the opinions and suggestions of the teacher, participating in the research, about the lessons that include games with recycled materials?

2. Methodology of the Research

In this research, a quasi-experimental design with pretest – posttest control group was used to measure the effect of games with recycled materials on learning English. The pretest-posttest control group design is applied by measuring the dependent variable of the subjects both at the beginning and after the experimental study. Subjects are divided into two groups as experimental and control group (Karasar, 2005: 87). The research was applied to 78 2nd grade students (33 girls, 45 boys) at Mehmet Ali Yasin Primary School in Eskisehir Central district in the 2020-2021 academic year. Students were divided into two groups as experimental and control groups. A pretest was applied to the students in both groups before the lesson; afterwards, the subject of "animals" was taught using classical methods to the students in the control group; the subject was taught using animal models with recycled materials in experimental group. The students in the experimental group were asked to make an animal model using the materials they frequently encountered in their daily lives and then they were asked to present the models they made. At the end of the lesson, to measure the success of the game activity, the pretest was applied as a posttest.

The test, applied to both experimental and control group as a pretest and posttest, aimed to measure the knowledge of students about the animals and their abilities. The test included 9 animals (frog, monkey, cat, dog, lion, bird, rabbit, duck and fish) and four verbs (jump, fly, swim and run). They were chosen among the animals children know about in their lives. As a total, there were 18 questions in the test, 9 of them were about animals and 9 of them were about their abilities. Students were asked to guess the name and ability of the animal shown in the test and write it under the picture (the words that the students needed to write were given in a box on the test). Same test was used as a posttest. Right after the game activity, a game evaluation form consisting of 4 open-ended questions was given to the students in the experimental group in order to get their opinions about the game they played and students were asked to fill in that form. The first part of the game evaluation form included demographic information of the students and the questions in the second part were as follows:

- Write the best three aspects of the game,

- Compare the lessons with games of recycled materials and lessons without games without games.
- Did this game make it easier for you to learn?
 - a. Yes, because...
 - b. No, because...
- Do you think the game needs any change? If yes, write with the reasons.

In order to get the opinions of the English teacher, who participated in the game activity, about the effect of the game with recycled materials, a semi structured interview was held with the teacher. The questions used in the interview were:

1. How was the motivation of the students?
2. Was the game suitable for the level of the students?
3. How useful do you think the game was for students' vocabulary acquisition?
4. Would you use this game for vocabulary acquisition?
5. Do you think the game made any changes to the classroom atmosphere?
6. How were the first and last finishers?
7. How were the students' attitudes towards the game?
8. Do you think that the game had any effect on the exam results of the students?
9. Is there anything else you would like to add?



1. Panda and chick models designed with plastic plates



2. Rabbit model designed with plastic plates

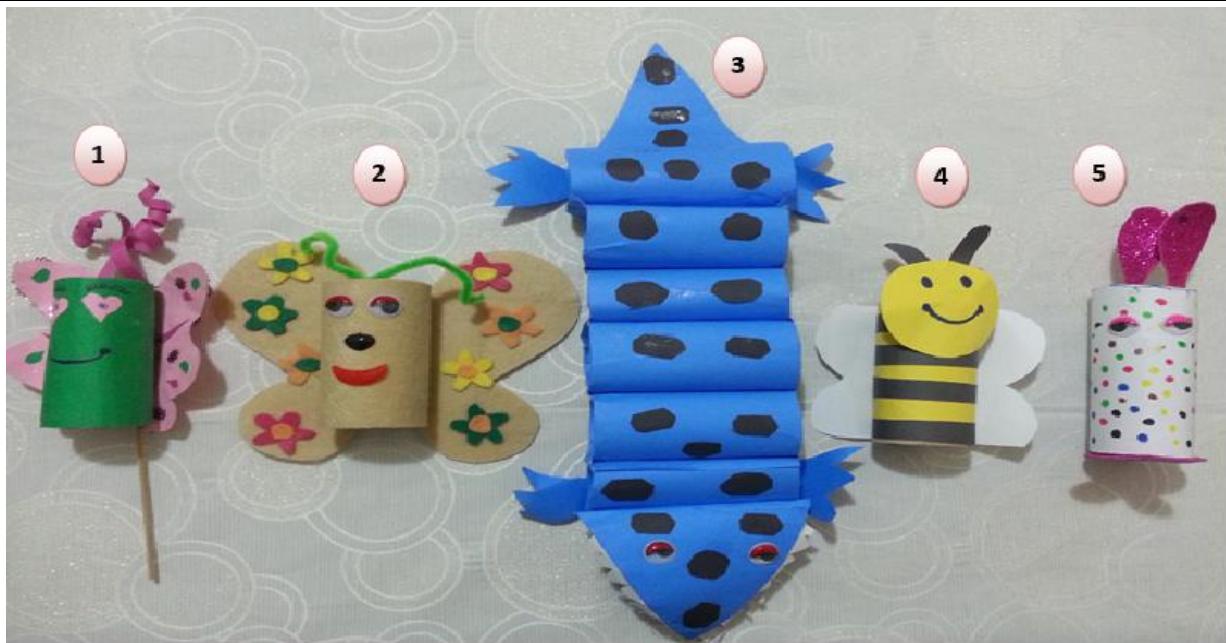


3. Caterpillar models designed with egg cartons



4. Rooster model designed with egg cartons

Figure 1: Animal Models with Recycled Materials – 1



5. Animal models designed with toilet paper rolls (1-2 butterfly / 3 - Crocodile / 4 - Bee / 5 - Rabbit

Figure 2: Animal Models with Recycled Materials – 2



Animal Models designed with bottles (1-Rabbit / 2- Rabbit / 3- Penguin / 4-Penguin / 5- Mouse / 6 - Mouse)

Figure 3: Animal Models with Recycled Materials - 3

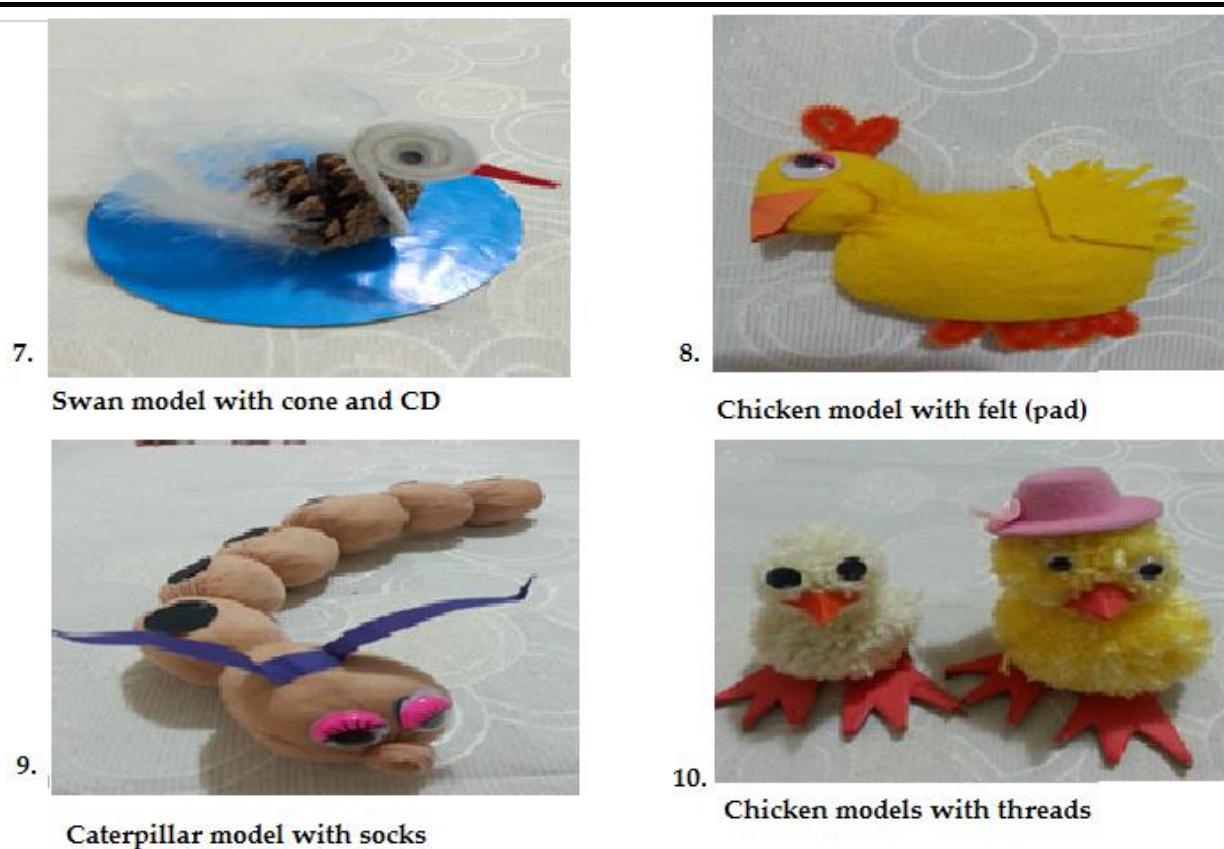


Figure 4: Animal Models with Recycled Materials – 4

2.1. Game Application Plan

Table 1: Game Application Plan

Time	Phases	Details of the Game Application Plan
Phase 1 (10 min)	Pretest	<ul style="list-style-type: none"> - Pretest is applied to measure the knowledge of students
Phase 2 (5 min)	Explanatory Speech	Details of the Application <ul style="list-style-type: none"> - Giving an explanatory speech to the students (why we are here, what we are going to do, how and why, etc.) - Explaining the objectives of the game, - Emphasizing the importance of the goals, - Presenting the materials, - Attracting students' attraction to the materials.
Phase 3 (25 min)	Application Phase	<ul style="list-style-type: none"> - The teacher asks students to make an animal model using the recycled materials.
Phase 4 (30 min)	Presenting the Animal Models	<ul style="list-style-type: none"> - Students present the models to their friends, - While doing this they can come to the board with their models and make sentences as if speaking from the mouth of the animal such as: a) I am a/an _____ I can _____ - Students can also imitate that animal's voice...
Phase 5 (10 min)	Posttest	<ul style="list-style-type: none"> - After the application phase, posttest is applied.

Phase 6 (20 min)	Game Evaluation	- To measure the effect of the game, students are asked to fill out the game evaluation form
Total time		Application takes 100 minutes.
materials	Bottles, egg cartons, toilet paper rolls, yoghurt or cheese cartoons, paper, fabric pieces, bottle lids, threads, glue, scissors, tapes etc.	

3. Results of the Research

3.1. Pre-test and Post-test Results

The results of the pre-test and post-test of both experimental and control group students are given in Table 2 below.

Table 2: Pre-test and Post-test Results of the Experimental and Control Groups

Group	Pre – Test Results				Post – Test Results							
	N	\bar{X}	SD	t test			N	\bar{X}	SD	t test		
				t	Sd	p				t	Sd	p
Exp. ¹	39	4,87	4,001	-,028	76	,977	39	17,36	1,405	8,551	43,930	,000
Control	39	4,90	3,979				39	10,23	5,013			

As seen in Table 2, there is no significant difference between the pre-test results of the students in both experimental and control groups ($p=,977$) and the readiness levels of the groups are found to be similar at the beginning. According to the post-test results; as the p value is 0,000, there is a significant difference between experimental and control groups in favor of the experimental group. Accordingly, it is seen that the games with recycled materials affect teaching of the "animals" subject positively. To see whether the games with recycled materials have a positive effect on the learning of experimental group, t-test is applied to the test results as shown in Table 3:

Table 3: t –test Results of the Pre-test and Post-test of the Experimental Group

Experimental Group	N	\bar{X}	SS	t test		
				t	Sd	p
Pre-Test	39	4,87	4,001	-,20,503	38	,000
Post-test	39	17,36	1,405			

The pre-test averages ($X= 4,87$) of the students in the experimental group have increased considerably in the post-test after the game activity. Students have about an average of 17,36 correct answers out of 18 questions. As can be seen in Table 3, since the p value between the tests is measured as 0,000, it can be said that the games with recycled materials have a positive effect on learning.

3.2. Opinions of the Students towards Games with Recycled Materials

After the game application, students were asked to answer four open-ended questions to get their opinions about the game. The questions are listed below:

- Write the best three aspects of the game,

- Compare the lessons with games of recycled materials and lessons without games without games.
- Did this game make it easier for you to learn?
 - c. Yes, because...
 - d. No, because...
- Do you think the game needs any change? If yes, write with the reasons.

Table 4: Answers of the Students to the First Question

Answers	Students Who Answered	F
Funny and Entertaining	s1, s2, s3, s5, s6, s7, s8, s9, s10, s12, s13, s14, s15, s16, s17, s18, s19, s20, s22, s23, s25, s26, s27, s28, s29, s30, s31, s32, s33, s35	31
Making Models	s1, s2, s3, s4, s5, s6, s7, s8, s9, s10, s12, s13, s14, s15, s16, s17, s18, s19, s20, s21, s22, s23, s25, s26, s27, s28, s29, s30, s31, s32, s33, s35, s36, s39	34
Using Recycled Materials	s2, s4, s5, s6, s7, s8, s9, s10, s12, s13, s14, s16, s17, s18, s19, s20, s21, s22, s23, s25, s26, s27, s28, s29, s30, s31, s32, s33, s34, s38	30
Developing Imagination	s1, s6, s7, s8, s10, s11, s12, s13, s19, s23, s24, s26, s28, s32	15
Pleasing	s3, s8, s11, s13, s17, s23, s24, s27, s28, s29, s30, s31, s34, s35, s37, a39	16
Animating and Imitating Animals	s4, s9, s11, s13, s14, s16, s20, s21, s25, s38	10
Being Happy	s1, s9, s15, s18, s23, s24, s39	7
Different	s2, s4, s5, s14, s30	5

In the first question, students are asked to write three aspects of the game activity they liked most and the answers are listed in Table 4. 35 students stated that the game is “*funny and entertaining*”. The student with code s7 said “*I played for the first time. It was a lot of fun*” and the student with code s32 emphasized the entertaining aspect of the game by saying “*I had fun while doing models*”. 34 of the students stated that “*making models*” was one of the most favorite aspects of the game. The student with code s2 said “*I learned while making models*”; the student with code s19 stated “*I had a lot of fun making models at school*” and drew attention to the making and presenting aspect of the game. 30 of the students stated that they liked “*using recycled materials*” aspect of the game. The student with code s27 stated that “*the recycled materials were evaluated*” and the student with code 21 stated that “*I learned to evaluate recycled materials*”. Apart from the answers above, students also stated that the game had such aspects as “*developing imagination, pleasing, animating and imitating animals, being happy and different*”.

Table 5: Answers of the Students to the Features of the Lessons with Game

Answers	Students Who Answered	F
Entertaining	s1, s2, s3, s4, s5, s6, s7, s8, s9, s10, s11, s12, s13, s14, s15, s16, s17, s18, s19, s20, s21, s22, s23, s24, s25, s26, s27, s28, s29, s30, s31, s32, s33, s34, s35, s36, s37, s38, s39	39
Making Happy	s1, s3, s4, s5, s6, s7, s9, s10, s11, s12, s14, s15, s16, s17, s18, s19, s20, s22, s23, s24, s25, s27, s29, s30, s31, s32, s34, s35, s36, s38	30
Instructive	s1, s2, s4, s5, s6, s7, s8, s10, s14, s15, s17, s19, s20, s22, s24, s25, s28, s29, s32, s33, s36, s37, s39	23
Beautiful	s1, s4, s5, s6, s7, s10, s11, s15, s16, s17, s22, s23, s28, s33, s34	15
Attractive	s1, s3, s4, s6, s8, s19, s20, s21, s22, s27, s29, s30, s31, s32, s33	15
Time Passes Quickly	s2, s4, s16, s19, s20, s26	6
Exciting	s3, s7, s17, s18, s22, s23, s27, s30	8
Developing Imagination	s10, s22, s28, s32	4
Memorable	s19, s23	2

Students are asked to compare features of the lessons with game and without game. The opinions of the students about the lessons with game were listed in Table 5 and Table 6. When Table 5 examined, all the students in the experimental group considered the lessons with games as "*entertaining*". 30 of the students stated that the lessons with games "*make them happy*"; 23 of them stated that the lessons with games were "*instructive*"; 15 students stated that the lesson with games were "*beautiful and attractive*". The students also stated that they liked the lessons with games in terms of "*quickly passing time, exciting, developing imagination and memorable*".

Table 6: Answers of the Students to the Features of the Lessons without Games

Answers	Students Who Answered	F
Boring	s1, s2, s3, s4, s5, s6, s7, s8, s9, s10, s11, s12, s13, s14, s15, s16, s17, s18, s19, s20, s21, s22, s23, s24, s25, s26, s27, s28, s29, s30, s31, s32, s33, s34, s35, s36, s37, s38, s39	39
Without Fun	s1, s2, s3, s5, s6, s7, s8, s9, s10, s11, s12, s13, s14, s15, s16, s17, s18, s20, s21, s22, s23, s24, s26, s27, s28, s29, s30, s31, s32, s33, s34, s35, s36, s37, s38	35
Making Unhappy	s1, s3, s4, s5, s7, s10, s11, s15, s17, s18, s19, s20, s23, s24, s27, s29, s30, s33, s36, s39	20
Unattractive	s6, s10, s14, s15, s16, s17, s18, s19, s20, s21, s22, s24, s25, s28, s29, s30,	16
Hard to learn	s1, s2, s4, s8, s14, s16, s18, s19, s20, s22, s25, s28, s29, s32, s33	15
Bad	s1, s2, s4, s22, s24, s25, s32, s33, s36, s38,	10
Ordinary	s3, s11, s36, s37, s38, s39	6

The answers given by the students about the lessons without games were given in Table 6. All the students in the experimental group stated that lessons without games were "*boring*". The majority of the students ($n=35$) stated that the lessons without games are "*not fun*" and 20 students stated that the lessons without games "*make them unhappy*". The students also stated that the lessons without games were "*unattractive, hard to learn, bad and ordinary*".

Table 7: Answers of the Students to the Third Question

Answers	Students Who Answered	F
Yes	All of the 39 students	39
I learned more easily	s2, s3, s4, s5, s7, s10, s11, s15, s17, s18, s19, s20, s22, s23, s24, s27, s29, s30, s33, s36, s37, s39	23
Making models was fun	s1, s3, s5, s6, s8, s10, s11, s12, s13, s17, s22, s23, s25, s27, s28, s29, s31, s32, s34, s35, s38	21
I had fun playing	s1, s2, s5, s8, s10, s14, s17, s20, s26, s27, s35, s36, s37,	13
We made models and presented them	s2, s5, s10, s14, s20, s21, s26, s28, s32, s38, s39	11
I learned to make models	s1, s7, s10, s14, s19, s21, s24, s25, s35, s36	10
I liked imitating animals	s1, s3, s7, s14, s17, s21, s24, s29, s30, s39	10
It became more permanent	s1, s4, s16, s18, s19, s20, s29, s34	8
It developed my imagination	s3, s4, s7, s9, s12, s14, s18, s19	8
I evaluated recycled materials	s1, s11, s15, s25, s29, s30,	6

Students in the experimental group were asked “*Did this game make it easier for you to learn?*” as the third question. All the students answered to this question as “*Yes*” and then explained how this game activity affected their learning. The reasons of the students were given in Table 7. 23 students stated that *they learned more easily*; 21 students stated that *making models was fun*; 13 students stated that *they had fun playing*; 11 students stated that they liked when they *made models and presented them*; 10 students stated that *they learned to make models and they liked imitating animals*. The students also stated that their learning was more *permanent*, the game *developed their imagination* and they learned how to *evaluate recycled materials*.

Table 8: Answers of the Students to the Fourth Question

Answers	Students Who Answered	F
No	All 39 Students	39
That is enough	s1, s3, s4, s5, s6, s7, s10, s11, s12, s14, s16, s17, s18, s19, s20, s21, s22, s25, s26, s27, s28, s29, s30, s31, s32, s33, s34, s35, s38	29
Beautiful as it is	s1, s5, s7, s9, s10, s11, s12, s19, s22, s23, s25, s26, s27, s29, s30, s31, s32, s33	19
Instructive enough	s8, s16, s17, s18, s19, s21, s28, s29, s30, s38,	10
I had fun	s1, s4, s5, s13, s22, s24, s30, s34, s38	9
It will be boring if it's changed	s10, s18, s21, s23, s24, s29	6
I learn better this way	s9, s28, s30, s39	4

Fourth and lastly, students in the experimental group were asked “Do you think the game needs any change? If yes, write with the reasons” to learn whether any changes should be done or not. All the students answered “*No*” to this question and stated that there was no need for a change in the game. Table 8 shows the data on the answers to this question. 29 students stated that the game activity was *enough* for their learning and it did not need to be changed; 19 students stated that it was *beautiful as it is*; 10 students said that it was *instructive enough*; 9 of them stated that they *had fun*; 6 students stated that *it would be boring if it's changed* and 4 of them stated that they *learned better this way*.

3.3. Teachers' Opinions about the Game with Recycled Materials

In the semi-structured interview with the teacher, nine questions were asked to find different perspectives of the teacher, who observed the students from the beginning to the end of the research, on the game activity. Regarding the motivation of the students, the teacher said "*the students made their models in a very pleasant way from the beginning to the end of the game activity, then they presented and imitated their models in front of their friends. They were very excited at every stage of the game activity both in the model making stage or the stage of presenting their animal models. They especially enjoyed presenting the models they made with their own handiwork*" and stated that the students were pleasant and excited in the game activity. As an answer of the second question "*Was the game suitable for the level of the students?*" the teacher said "*In the game activity, 'animals' subject was aimed to be taught to the 2nd grade students by using recycled materials. As the 'animals' subject was one of the subjects in 2nd grade English curriculum and the students were asked to make animal models themselves, the game could be considered suitable for their level*" and stated that the game could be considered suitable both for their understanding level and physical development. The teacher was asked "*How useful do you think the game was for students' vocabulary acquisition?*" to learn the effect of the game on their vocabulary acquisition. She stated that "*Students in the study were interested in animals due to their age. When they were asked to make an animal model they liked and then to present and imitate their models using English vocabulary and sentences, they started the game more willingly and presented their models in a good way. At the end of the lesson, they stated that they wanted to make models again for the next week and this time they would prepare different animal models and present them in a much better way*" and stated that the subject chosen for the game attracted their attention and thus they learned the target vocabulary more easily. As an answer to the question "*Would you use this game for vocabulary acquisition?*" the teacher said "*Students learned in a much more enjoyable way with the game. For this reason, I would like to use this game in teaching different subjects*" and stated that she liked and was willing to use this game format.

In order to find out whether the game had any positive or negative effects on the classroom atmosphere, the question "*Do you think the game made any changes to the classroom atmosphere?*" was asked to the teacher. She said "*Students were very excited from the beginning to the end of the game activity. Before I started the game, I clearly stated the rules of the game. The students made their models carefully and in the presenting stage of their models, though some were shy to talk, they presented their models with the encouragement of their friends. Some students even added fun to the game by imitating the movements of the animal they made or making the sound of it*" and stated that the game activity allowed students to learn while having fun. As an answer to the question "*How were the first and last finishers?*" the teacher said "*the students who finished their model first started to wait excitedly for their other friends to present the models they made. Although they were a little bit bored at first, some of them started to watch their other friends and some of them started to help. The students, who made their model a little slowly, started to panic when they saw their friends finishing their models, but with the support of my suggestions and other friends' support, they finished their models quickly*" and stated that with the game they also learned helping each other and using time efficiently.

In order to learn the positive – negative attitudes of the students towards the game, “*How were the students' attitudes towards the game?*” question was asked to the teacher. The teacher answered this question saying “*When I told the students that we would make animal models using simple materials that they could easily find at home they were skeptical at first about how to make them, but after I explained the game and introduced the materials they could use, they thought a little and came up with very beautiful models. While playing the game, they realized that they also learned about the animals*”. The teacher stated that while the students acted uneasily at first and showed negative attitude towards the game activity, they showed positive attitude towards the game and enjoyed it once they started and learned how to play it. In order to find out whether the game activity had any positive or negative effects on the exam results of the students, the teacher was asked “*Do you think that the game had any effect on the exam results of the students?*” question. She said “*Before starting the game activity, students were given a pre-test to measure how much knowledge they had. Then, the same exam that was used as a pre-test was given as a post-test after the game activity. Many students who had only a few correct answers in the pre-test were able to answer all the questions correctly. This made me very happy*” and stated that especially the fact that many students who got low results in the pre-test did all the questions in the post-test correctly showed that the game activity contributed positively to the learning of the students.

4. Discussion and Conclusion

According to the results of the research, the students both enjoyed and learned the ‘animals’ subject better while learning with the game with recycled materials. They were very excited and had fun while preparing the models and presenting them in the class. The significant relationship between the pre-test and post-test results of the experimental group shows that the game has a positive effect on the learning of the students. This result supports many previous researches on the effect of games on learning English (İşik and Semerci, 2016; Dervişoğlu, 2008; Kalaycioğlu, 2011; Demirci, Hamzaçebioğlu and Arslan, 2021; Demirci and Olur, 2018; Tosuncuoğlu, 2014).

In the research, students were asked to make a model of an animal using recycled materials using their creativity and imagination in teaching a subject they had not learned before and thus their attention to the lesson wanted to be drawn. As Ülküdür and Bacanak (2013) stated, an educational game, which is appropriate for the level of students and expressed in a clear and understandable way, both increases the motivation of the students and makes the lesson more attractive for them (Ülküdür and Bacanak, 2013: 38). It is important for students to make animal models using recycled and natural materials in terms of developing their creative thinking skills, imagination, sensitivity to the environment, looking at events from a different perspective and problem solving skills (Yaşar, İnal, Kaya and Uyanık, 2012: 37). The primary step in being a conscious consumer is to gain awareness first. When students realize that they can produce something new using recycled materials, they will take a step towards becoming sensitive individuals by using materials.

As a result, considering the pre-test and post-test result of the students, the data obtained from the opinions of the students about the game and the opinions obtained from the teacher participating in the research, it was clearly seen that the game with recycled materials had a positive effect on students' vocabulary learning. For this reason, it is thought that this game can be used by adapting it to English teaching or other subjects and it may be beneficial for students to learn while having fun.

Conflict of Interest Statement

The authors declare that there is no conflict of interest.

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