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To cite this article:

Yazici, N. (2023). Investigation of metaphoric perceptions of primary mathematics teachers on the concept of game. *International Journal of Research in Education and Science (IJRES)*, *9*(1), 76-91. https://doi.org/10.46328/ijres.3092

IJRES International Journal of Research in Education and Science
2023, Vol. 9, No. 1, 76-91 https://doi.org/10.46328/ijres.3092

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Article Info

Article History

Received:
30 May 2022
Accepted:
10 December 2022

Keywords

Primary mathematics teacher
Game
Metaphor

Abstract

The purpose of this research is to examine the meanings that primary school mathematics teachers attribute to the concept of "game" by using metaphorical expressions. In this study, phenomenology design, one of the qualitative research methods, was used to examine the metaphorical perceptions of primary school mathematics teachers about the concept of game. The study group of the research consists of 329 primary school mathematics teachers. In order to collect the data of the research, the participants were asked the question “the game is similar to …, because…”. In addition, the participants were asked to draw pictures suitable for their answers to the questions. The data obtained within the scope of the research were subjected to content analysis and Chi-square tests. When the metaphors developed by primary school mathematics teachers regarding the concept of play were examined, it was seen that most of the teachers perceived the game as "a child-specific activity (41%)". On the other hand, it has been observed that approximately one fifth of the teachers see the game as a "teaching method (18%)". In the study, it was determined that the professional seniority of the mathematics teachers had an effect on the metaphors they developed regarding the concept of game. In addition, it was observed that the level of mathematics teachers' involvement in the game in their professional lives had an effect on their development of metaphor as a teaching method.

Introduction

George Bernard Shaw quotes the relationship between man and play: “We don't stop playing because we grow old; we grow old because we stop playing.” (Shaw, 1922). Huizinga (1955) considered the game as the most important element in the formation of cultures and stated that one of the most basic needs of human beings is to make a game. In this context, it can be said that games prepare the individual for life as a part of life. Because, in addition to meeting many of the physical and spiritual needs of people, the game is the first natural learning method of every person (Bardak, 2018). In this sense, Caillois (2001) expressed the game as a tool that enables the child to pass from individuality to a social and cultural structure.

Children recognize themselves through games, recognize and understand the objects in the environment, and transfer their feelings and thoughts to the outside world (Hirsh-Pasek etc., 2009; Jones & Cooper, 2006).

Therefore, the game develops the child's interest and curiosity, activates his/her mental skills, increases his/her creativity and contributes to the application of what he/she has learned (Bodrova & Leong, 2019; Park, 2019; Saracho, 1999). In summary, game creates a brain that increases flexibility and develops potential for learning later in life (Lester & Russell, 2008).

Davis, Hersh and Marchisotto (2012) describe mathematics as just a logical inference game, starting with arithmetic. As a matter of fact, going from concrete to abstract and making comments on concepts, which are followed in learning a mathematical concept, can also be observed in games played from childhood to adulthood. In other words, it is not difficult to find mathematics within games and games within mathematics. Umay's (2002) statement “While games involve mostly mathematics, mathematics is a game completely” also supports this idea. As a matter of fact, many mathematicians also emphasized the game side of mathematics. With their childlike aspects, mathematicians contributed to the development of mathematics by being interested in games, on the other hand, they also helped non-mathematicians to get closer to and sympathize with mathematics (Uğurel & Moralı, 2008).

Mathematics is a branch of science that consists of abstract concepts (İnan, & Erkuş, 2019; Önal & Aydın, 2018; Uğurel & Moralı, 2006). Therefore, it is important to make abstract concepts concrete in mathematics teaching (Tutak, 2009) and to be able to make sense of these concepts (Altun, 2006). It is thought that learning environments enriched with games will contribute positively to students' understanding of abstract concepts and terms. Because games are actions where motivation, creativity and learning take place at a high level (Boyer, 1997; Güven, 2003; Hirsh, 2004). Therefore, in the game, the child is free from the fear of failure, there is no stress and anxiety in situations that require success and learning, and he/she does not hesitate to try different things (Driscoll & Nagel, 2008). In this context, the game, which is seen as wasted time by many adults, is thought to be an important educational tool besides being a fun activity (Saracho, 1991). Children expressed having to do something as "work" and doing something willingly as "play" (Howard, 2002; Wing, 1995). Therefore, both children's skills should be developed and the quality of education should be increased by using games in the teaching process. Ceglowski (1997) states that teachers can plan better activities by observing children's play.

The shortest way to alienate the child from learning is to remove him/her from the game and try to train in strict rules. Instead, it is necessary to use the game as an aid for learning (Chateau,1979; Yörükoğlu, 2016). In other words, many of the mathematical activities can be performed through gamification. It is thought that the point of view of the mathematics teacher on the game is important in this regard. The basic point of view that teachers should have about the game is the idea that the game is not an absurd effort (Hirsh-Pasek & Golinkoff, 2008). Because by many adults, the game is perceived as an aimless pursuit in which the child has fun alone or with his/her friends. Even more, it is thought that the game is an action that the individual who does not have a job does to linger or spend time (Aksoy & Dere Çiftçi, 2014).

However, children see play as their main occupation and their most important job. In this context, it is thought that determining the meanings that mathematics teachers attribute to the concept of game is important in terms of gamification in the teaching process. Metaphorical expressions can be used to describe and make sense of this

idea more concretely. As a matter of fact, metaphors first form in the mind. That is, our everyday conceptual system (terms with which we think and act) is fundamentally metaphorical in nature (Lakoff & Johnson, 2008). Metaphorical expression is to express a concept similar to it while describing a concept, to express it in a novel or poetic language with a use other than its traditional meaning (Lakoff, 1994).

In this context, the aim of this research is to examine the meanings that primary school mathematics teachers attribute to the concept of "game" by using metaphorical expressions. In addition to this, it was also desired to determine the differentiation levels of the metaphors produced according to the professional experience and the level of giving to the game. For this purpose, the research problems were determined as follows:

1. What are primary school mathematics teachers' metaphorical perceptions about the concept of game?
2. Is there a relationship between the metaphors produced regarding the concept of game as a teaching method and professional experience?
3. Is there a relationship between the metaphors produced regarding the concept of game as a teaching method and the level of giving place to the game?

Method

Research Design

In this study, phenomenology design, one of the qualitative research methods, was used to examine the metaphorical perceptions of primary school mathematics teachers about the concept of game. Phenomenological research aims to reveal our experiences and the meanings we attribute to these experiences in our own world by focusing on the phenomena that we are aware of in daily life but do not have a deep and detailed understanding of (Creswell, 2007). The focus of this research is the concept of “game”. It is aimed to determine the approaches of primary school mathematics teachers, both as a teacher and as an adult, regarding this phenomenon.

Study Group

The study group of the research consists of 329 primary school mathematics teachers working in eight different cities in the Central Anatolian Region of Turkey between the years 2019-2021. The criterion sampling method was preferred in the formation of the study group. It was determined as a criterion to be a primary school mathematics teacher, to have been actively practicing for at least two years, and to have included a game activity in the teaching process at least once. The distribution of primary school mathematics teachers in the study group is given in Table 1.

Table 1. The Study Group

	Years	**f**	**%**
Professional experience	1-5 years	142	
	6-10 years	114	
	11 years and above	73	
	Total	329	100

	Number of games	f	%
Involvement of play in the teaching process	I have included at least once.	193	
	I have included two to five times.	81	
	At least five times	55	
	Total	329	100

Data Collection Tools

In this research, "Metaphoric Perception Form Regarding Game [MPFG]" was used as data collection tool. MPFG consists of two categories. In the first category, there is information about demographic information (year of seniority, availability of teaching with games). The second category includes questions to identify metaphorical perceptions. For this reason, the participants were asked the question "the game is similar to …, because…". In addition, the participants were asked to draw pictures suitable for their answers to the questions. Particularly, the participants were asked to draw pictures for the answer to the question why. For this reason, sufficient spaces were provided under each question asked to the participants in MPFG, where they could draw a picture of the metaphor they produced. In qualitative studies, visual data such as pictures or cartoons can be used as well as written data. The use of these visual data as an additional data source in qualitative studies significantly increases the reliability of the study (Creswell, 2013).

While creating the data collection tool, the opinions of two mathematics education experts were consulted. It has been determined that the questions in the content of the data collection tools are sufficient as they are, both due to the nature of the metaphorical study and in line with the expert opinion. A pilot study was conducted with five teachers in order to determine the application time of the data collection tool and to minimize possible errors. Within the scope of the pilot application, 20 minutes was determined to be sufficient. The data of the study were collected over a period of approximately two years.

Analysis of Data

The data obtained within the scope of the first problem of the research were subjected to content analysis. The data obtained through content analysis are organized under certain categories in a way that the reader can understand (Creswell, 2013). Content analysis was carried out in four stages:

Coding and Debugging Phase

At this stage, after all the metaphors developed by each participant in the research were coded, they were listed in the NVivo 12 program. The obtained data were firstly examined in general. Then, 22 forms belonging to the teachers who were missing in the interview form (any of the metaphor or picture) were excluded from the evaluation. After these procedures, 329 forms were evaluated. The evaluated forms were coded as teacher + form number (T1).

The Stage of creating a Metaphor List

At this stage, the metaphors created by the teachers regarding the concept of game were examined separately and valid and invalid metaphors for each concept were determined. According to the results obtained, it was determined that 329 valid metaphors were produced.

Category Determination Phase

The obtained data were firstly translated into English. Then, the metaphors developed by the teachers participating in the research were divided into categories by examining the reasons for the expression “because…” stated in the form. During the creation of the categories, NVivo 12 package program and expert opinions were used. Regarding the concepts in the common categories obtained with the NVivo 12 program, the category names were determined together with the experts to best represent the common metaphor. The 329 metaphors created by the teachers regarding the concept of "game" were gathered under seven different categories. These categories were formed as “a child-specific activity, teaching method, cultural element, timewasting, entertainment, sudden passion” and “other”.

Ensuring Validity and Reliability

The list of metaphors created in order to ensure the validity and reliability of the research and the list of metaphor categories were presented to the opinion of two mathematics education experts. Experts were asked to match the metaphor list with the category lists. At this stage, it was observed that the 17 metaphors developed in the "a child-specific activity" category and the "entertainment" category had similarities. For this reason, it was deemed appropriate to reach a decision in line with the reason sentences and pictures written for the expression "because". The reliability of the research was tried to be ensured by using the "inter-coder consistency" introduced by Miles and Huberman (1994). In determining the reliability, the formula [Agreement / (Agreement + Disagreement) x 100] suggested by Miles and Huberman (1994) was used. Then, the "disagreement" and "agreement" situations regarding each data were determined, and the percentage of agreement between the coders was found at the level of 96% reliability. Since this result was above .90, it was accepted that the reliability of the research was ensured (Miles & Huberman, 1994). The percentage of agreement among the coders is given in Table 2.

Table 2. Inter-coder Consistency

Metaphor	Number of Metaphors with Agreement (f)	Number of Metaphors with Disagreement (f)	Inter-coder Consistency (%)
Game	316	13	96

Chi-square analysis was used in the analysis of the data obtained within the scope of the second and third problems of the research. For this purpose, metaphors and other metaphors developed as a teaching method were coded separately in the SPSS 22 program. At this stage, the focus was on the differences in the metaphors that teachers developed in the context of educational play and professional seniority.

Results

Findings related to the First Problem of the Research

The metaphors developed by the teachers for the concept of game, the frequency values and percentages of these metaphors are given in Table 3.

Table 3. Metaphors Developed for the Concept of Game

Item Number	Metaphor	Frequency (f)	Item Number	Metaphor	Frequency (f)
1	Childhood	33	27	Interaction	1
2	Chocolate	21	28	Street	1
3	Rainbow	21	29	Rule	1
4	Dream world	21	30	Penalty	1
5	Theatre	16	31	Water	1
6	Slide	16	32	Strength	1
7	Life	16	33	Football	1
8	Spring	15	34	House	1
9	Lego	15	35	Teaser	1
10	Book	15	36	Learning	1
11	Jigsaw	15	37	Mountain	1
12	Labyrinth	14	38	Movie	1
13	Medal	14	39	School	1
14	Happiness	14	40	Bridge	1
15	Competition	12	41	Carbohydrate	1
16	Make a picture	10	42	Candle	1
17	Sweet	8	43	Human eye	1
18	Number line	7	44	Sun	1
19	Time	5	45	Galaxy	1
20	Teacher	5	46	Pacifier	1
21	Tree	5	47	Sea ball	1
22	Compass	1	48	Impeller	1
23	Examination paper	1	49	Mirror	1
24	Numbers	1	50	Success	1
25	Medicine	1	51	Magic wand	1
26	Naturalness	1	52	Pastry	1
				Total	**329**

When Table 3 is examined, the most developed metaphors are as follows: Childhood (f=33), chocolate (f=21), rainbow (f=21), dream world (f=21), theatre (f=16), slide (f=16), life (f=16), spring (f=15), lego (f=15), book

(f=15), jigsaw (f=15), labyrinth (f=14), medal (f) =14), happiness (f=14), competition (f=12) and make a picture (f=10). In addition, it is seen that teachers have developed 53 different metaphors related to the concept of game.

In Table 4, the metaphor categories developed for the concept of "game", the number of metaphors in each category, the total number of metaphors and their percentages are indicated. The explanations given to the question "because" were decisive in placing the metaphors into categories.

Table 4. Categories of Metaphors Developed for the Concept of Game

Item Number	Categories	Metaphor	Total Metaphor (f)	Percent (%)
1	A Child-Specific Activity	Childhood, rainbow, dream world, Lego, jigsaw, pacifier, spring, pastry, happiness	136	41
2	Teaching Method	Life, book, labyrinth, learning, teacher, school, bridge, mountain, impeller, success, tree, compass, rule	60	18
3	Entertainment	Theatre, slide, medal, make a picture, sea ball	57	17
4	Sudden Passion	Chocolate, sweet, water, carbohydrate, medicine	32	10
5	Timewasting	Time, competition, football, movie, teaser, house, candle	22	7
6	Cultural Element	Street, interaction, naturalness	3	1
7	Other	Number line, strength, magic wand, mirror, examination paper, numbers, human eye, sun, galaxy, penalty	19	6
		Total	**329**	**100**

When Table 4 is examined, metaphors developed by teachers for the concept of "game" are grouped under seven conceptual categories, considering their common features. These categories were formed as “a child-specific activity, teaching method, entertainment, sudden passion, timewasting, cultural element” and “other”. For each metaphor obtained, the explanations written by the teachers and the meanings of the created metaphors, category titles were created according to the reason of the metaphor.

Category 1: A Child-Specific Activity

When Table 4 is examined, it is seen that a total of nine different metaphors belonging to the category of "a child-specific activity" were created by 136 teachers. Considering the frequency distributions of the created metaphors, the most frequently used ones are “childhood” (f:33), “rainbow” (f:21), and “dream world” (f:21). Below are some

of the metaphors developed for the category of "a child-specific activity" and some of the visuals belonging to these metaphors:

T18:“The game is like children. Because children play games to have fun and be happy. When I play, the child in me comes out.”

T65:“The game is similar to my childhood memories. Because I don't want it to end. Because I will be happy.”

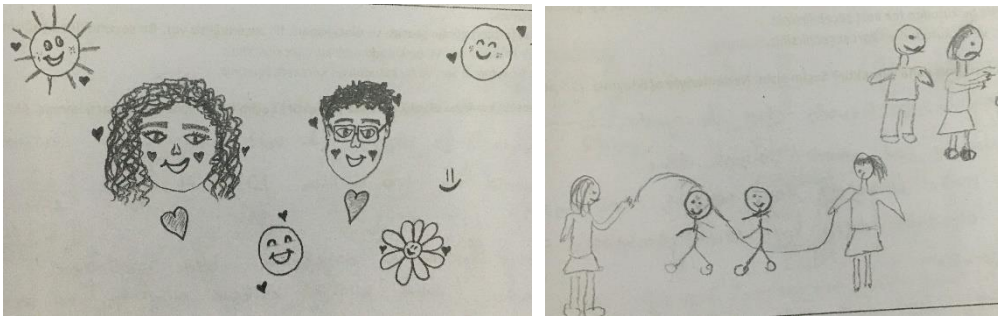

Figure 1. Some of the Drawings of the Developed Metaphors

Category 2: Teaching Method

When Table 4 is examined, it is seen that a total of 13 different metaphors belonging to the "teaching method" category were created by 60 teachers. Considering the frequency distributions of the created metaphors, "life" (f:16), "book" (f:15) and "labyrinth" (f:14) are the most frequently used ones. Below are some of the metaphors developed for the "teaching method" category and some of the visuals belonging to these metaphors:

T125:“A game is like a book. Because it is a teaching tool. We can learn a lot through games.”

T236:“The game is like a labyrinth. Because sometimes you can't find the exit, sometimes you reach the exit very easily. But you always learn something. They are indispensable tools for our own learning experiences.”

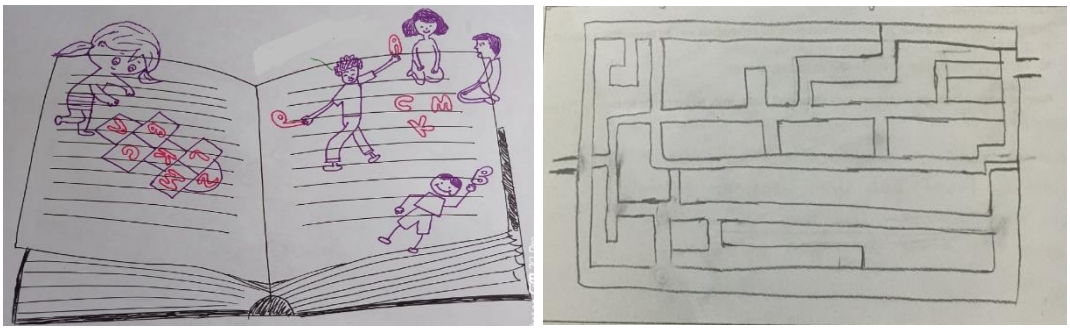

Figure 2. Some of the Drawings of the Developed Metaphors

Category 3: Entertainment

When Table 4 is examined, it is seen that a total of five different metaphors belonging to the "entertainment" category were created by 57 teachers. Considering the frequency distributions of the created metaphors, the most

frequently used ones are “theatre” (f:16), “slide” (f:16) and “medal” (f:14). Below are some of the metaphors developed for the "entertainment" category and some of the images belonging to these metaphors:

T113:“It is like winning a medal. It is very entertaining and enjoyable. You compete and you become the first. You have fun.”

T152: “A game is like theatre. If the theater is fun, we watch it. If the game gives fun, we play.”

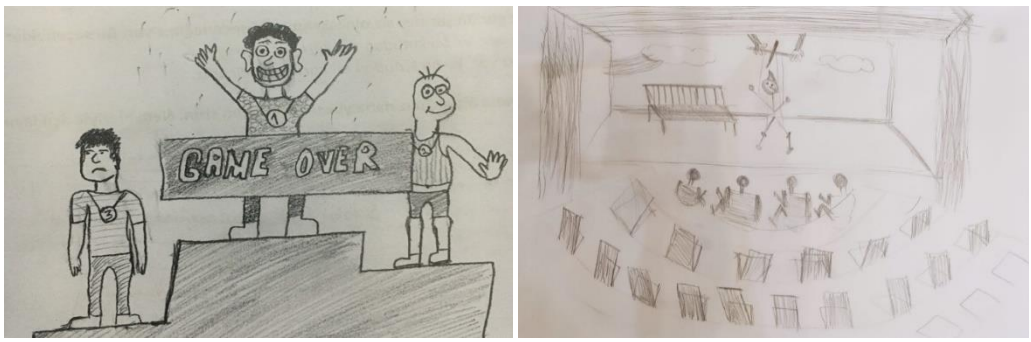

Figure 3. Some of the Drawings of the Developed Metaphors

Category 4: Sudden Passion

When Table 4 is examined, it is seen that a total of five different metaphors belonging to the category of "sudden passion" were created by 32 teachers. Considering the frequency distributions of the created metaphors, "chocolate" (f:21) and "sweet" (f:8) are among the most frequently used ones. Below are some of the metaphors developed for the category of “sudden passion” and some of the images belonging to these metaphors:

K108:“The game is like dessert. Sweet food is an after-dinner need. But it ends quickly. It satisfies you. It is a momentary need in games. It relaxes you, even for a moment.”

K155:“Game is like chocolate. We need chocolate. Just like that, we need it, we play. Chocolate is not always eaten, and the game is not always played.”

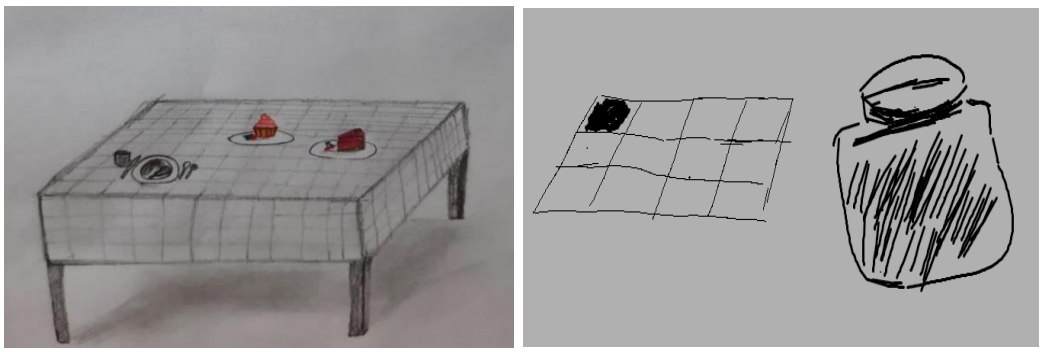

Figure 4. Some of the Drawings of the Developed Metaphors

Category 5: Timewasting

When Table 4 is examined, it is seen that a total of seven different metaphors belonging to the category of "timewasting" were created by 22 teachers. Considering the frequency distributions of the created metaphors,

"competition" (f:12) and "time" (f:5) are among the most frequently used ones. Below are some of the metaphors developed for the category of "timewasting" and some of the images belonging to these metaphors:

T28: “Playing is wasting time. Because the game is played in free time.”

T179: “The game is like a competition. In the competition, the spectator also spends time with the competitor. Then the game is over. Time will pass.”

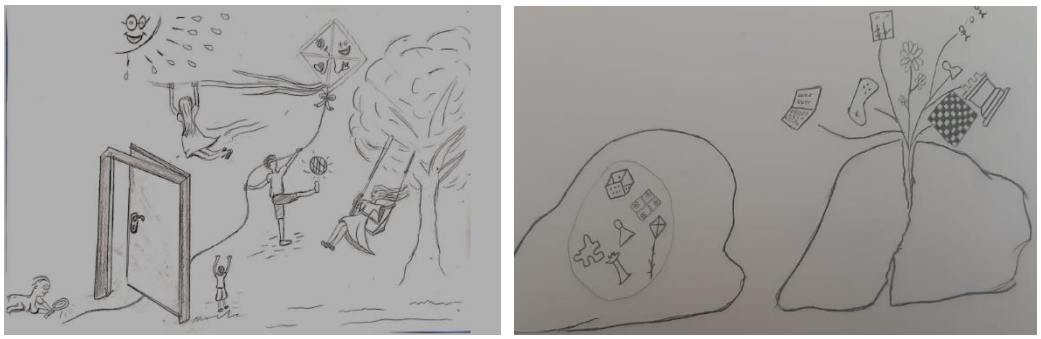

Figure 5. Some of the Drawings of the Developed Metaphors

Category 6: Cultural Element

When Table 4 is examined, it is seen that three different metaphors belonging to the "cultural element" category were created by three teachers. The frequency distributions of the created metaphors are “street” (f:1), “interaction” (f:1) and “naturalness” (f:1). Below are some of the metaphors developed for the "cultural element" category and some of the images belonging to these metaphors:

T195: “The game is like the street. Because every child has a past memory of a game on the street. Our streets bring the past into the present.”

T315: “The game is like interaction. Because there is communication in the game. There is a sharing of savings.”

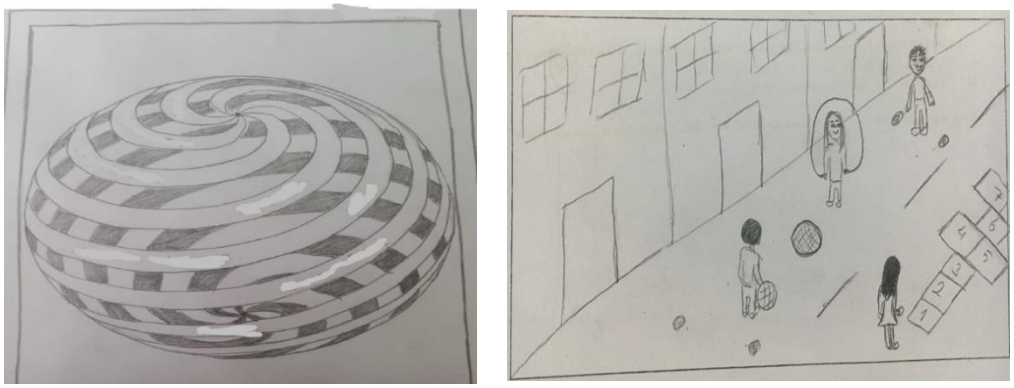

Figure 6. Some of the Drawings of the Developed Metaphors

Category 7: Other

When Table 4 is examined, it is seen that a total of 10 different metaphors belonging to the "other" category were

created by 19 teachers. Below are some of the metaphors developed for the "other" category and some of the images belonging to these metaphors:

T09: “The game is like a mirror. Because I see the reflection of my own soul world in the game. I know myself.

T78: “The game is like a galaxy. Because it always requires action.”

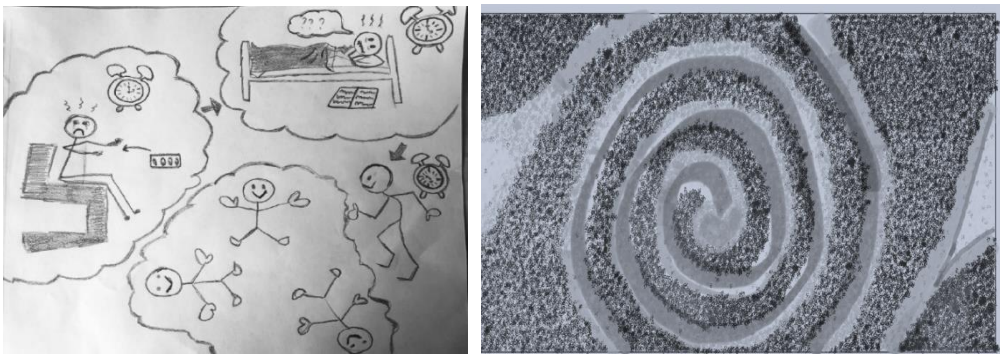

Figure 7. Some of the Drawings of the Developed Metaphors

Findings related to the Second Problem of the Research

The chi-square statistics technique was used to determine whether there is a difference between the metaphors developed by the mathematics teachers participating in the research regarding the concept of game as a teaching method and professional experience. Chi-square significance values are given in Table 5.

Table 5. Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	6,153[a]	2	,046
Likelihood Ratio	6,297	2	,043
Linear-by-Linear Association	6,002	1	,014
N of Valid Cases	329		

a. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 13,31.

When Table 5 is examined, it is seen that there is a statistically significant relationship between metaphor development as a teaching method and professional experience. Table 6 includes cross-tables for the chi-square test. When Table 6 is examined, it is seen that the rate of teachers who are between 1-5 years in terms of professional seniority, developing metaphors as a teaching method is higher than the rate of metaphors that are not developed for teaching. On the other hand, the situation is the opposite for teachers of 6-10 years and 11 years or more. It can be said that the adulthood periods of mathematics teachers are effective in the emergence of this finding. As a matter of fact, play is seen as wasted time by many adults (Chateau, 1979). Therefore, the level of playing games and teaching with games will be less in adulthood.

Table 6. Metaphor * Professional Experience Crosstabulation

			Professional experience			Total
			1-5 years	6-10 years	11 years and above	
Metaphor	Developing metaphor as a teaching method	Count	34	18	8	60
		% within Metaphor	56.7%	30.0%	13.3%	100.0%
	Those who fail to develop a metaphor as a teaching method	Count	108	96	65	269
		% within Metaphor	40.1%	35.7%	24.2%	100.0%
Total		Count	142	114	73	329
		% within Metaphor	43.2%	34.7%	22.2%	100.0%

Findings related to the Third Problem of the Research

Chi-square statistics technique was used to determine whether there is a difference between the metaphors developed by the mathematics teachers participating in the research regarding the concept of game as a teaching method and the level of including the game in the teaching process. Chi-square significance values are given in Table 8.

Table 8. Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	14.556[a]	2	.001
Likelihood Ratio	12.638	2	.002
Linear-by-Linear Association	10.364	1	.001
N of Valid Cases	329		

a. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 10,03.

When Table 8 is examined, it is seen that there is a statistically significant relationship between metaphor development as a teaching method and the level of using the game in the teaching process. Table 9 includes the cross tables for the chi-square test.

When Table 9 is examined, it is seen that the rate of developing instructional metaphors is higher for teachers who use the game more than five times throughout the teaching profession. On the other hand, it is seen that the rate of instructional metaphor development of teachers who use game teaching method between one and five times throughout the teaching profession is also lower. When the second line in Table 9 is examined, it has been determined that the number of teachers who do not develop instructional metaphors increases as the level of using the game in the teaching process decreases. This finding can be interpreted as the level of teachers' involvement in play in the teaching process is effective on the metaphors they have developed.

Table 9. Metaphor * Involvement of Play in the Teaching Process Crosstabulation

			Involvement of play in the teaching process			Total
			I have included at least once.	I have included two to five times.	At least five times	
Metaphor	Developing metaphor as a teaching method	Count	28	12	20	60
		% within Metaphor	46.7%	20.0%	33.3%	100.0%
	Those who fail to develop a metaphor as a teaching method	Count	165	69	35	269
		% within Metaphor	61.3%	25.7%	13.0%	100.0%
Total		Count	193	81	55	329
		% within Metaphor	58.7%	24.6%	16.7%	100.0%

Discussion and Conclusion

Many mathematicians have looked at mathematics as a game and have approached many problems in mathematics with their playful aspects (Davis, Hersh, & Marchisotto, 2012; Umay, 2002). Therefore, this instructive aspect of the game can be used in the teaching process. In that case, the mathematics teacher should have an understanding to reveal this aspect of the game. When the metaphors developed by primary school mathematics teachers regarding the concept of play were examined, it was seen that most of the teachers perceived the game as "a child-specific activity (41%)". On the other hand, it has been observed that approximately one fifth of the teachers see the game as a "teaching method (18%)". When these two findings are evaluated together, it can be said that the teachers' perspective on the game is low in terms of educational activity. As a matter of fact, Aksoy and Dere Çiftçi (2014) also stated that the game is perceived by many adults as an effort for the child to have fun on his own or with his friends. The finding in the study that 34% of the teachers perceive the game as "entertainment, sudden passion" and "timewasting" is also in line with the results of Aksoy and Dere Çiftçi (2014).

Huizinga (1955) states that the game has an undeniable importance in cultural interaction. In this study, only three metaphors (1%) among 329 metaphors developed by the mathematics teachers were of the quality to be a cultural element of the game. This finding can be interpreted as that mathematics teachers are far from the perception that play can be an effective tool in establishing intergenerational relations.

In the study, it was determined that the professional seniority of the mathematics teachers had an effect on the metaphors they developed regarding the concept of game. To put it more clearly, it has been observed that mathematics teachers who have a seniority of 1-10 years in terms of professional seniority have developed metaphors as a "teaching method" regarding the concept of game. This result can be interpreted as the perception of play as wasted time in adulthood. As a matter of fact, the perception of the game as "sudden passion" and

"timewasting" by the teachers also confirms this result. The results of Önder (2000) and Saracho's (1991) research that "game is perceived as wasted time by adults" are also in line with the results of this research.

In the study, it was observed that the level of mathematics teachers' involvement in the game in their professional lives had an effect on their development of metaphor as a teaching method. In other words, it has been observed that mathematics teachers who give more space to play in the teaching process develop metaphors as a teaching method. This result can be interpreted as including the game in the learning process also affects the metaphors developed by the teacher regarding the game. Based on this result, it can be stated that teachers who develop metaphors as a teaching method see the game as a tool to help learning (Yörükoğlu, 2016). As a matter of fact, besides being a fun activity, the game is an important educational tool (Chateau, 1979; Önder, 2000; Saracho, 1991).

The following recommendations can be made as a result of the research:

- Mathematics teachers can gain different perspectives on the game with in-service training on the concept of the game and the philosophy of the game. To put it more clearly, the point of view of mathematics teachers about the game as a teaching activity and cultural element should be supported by in-service training.
- This research can be carried out with teachers from different branches, and in general, teachers' perspectives on the game can be determined.

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